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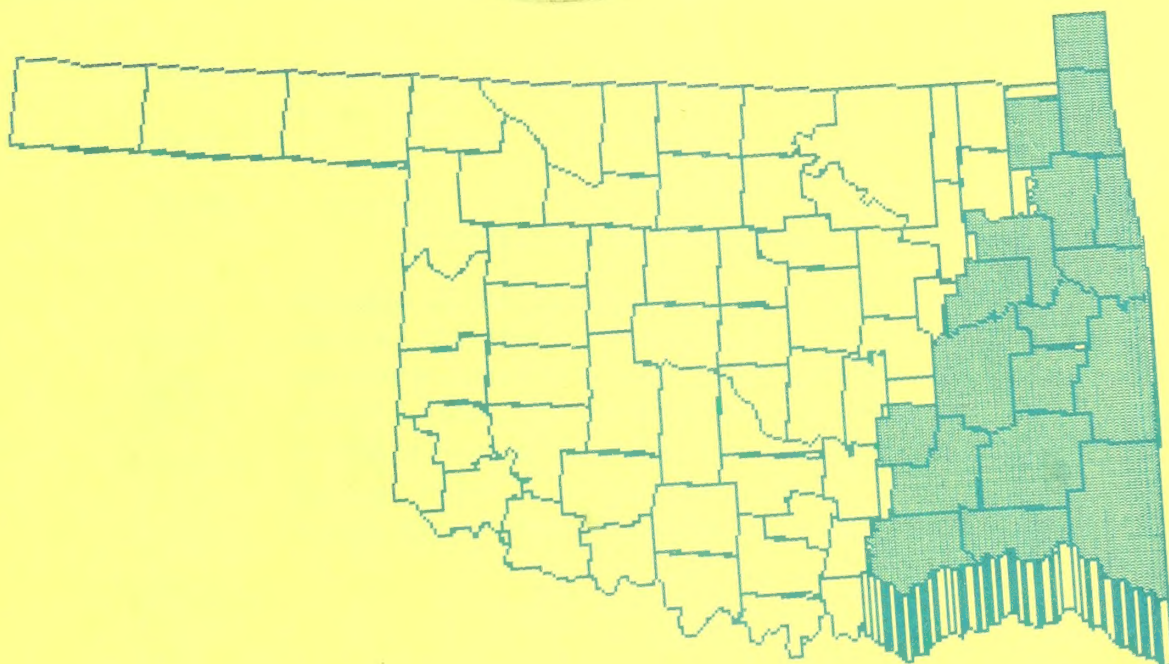
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Forest Statistics for East Oklahoma Counties - 1986

Franklin D. Hines and Daniel F. Bertelson



SUMMARY

The Southern Forest Survey, an activity of the Southern Forest Experiment Station Forest Inventory and Analysis work unit, covers the states of Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, Tennessee, east Texas and the island of Puerto Rico.

This survey is part of the nationwide Forest Survey originally authorized by the McSweeney-McNary Act of 1928. More recent legislation pertinent to the survey mission includes the Forest and Rangeland Renewable Resources Planning Act of 1974 and the Forest and Rangeland Renewable Resources Research Act of 1978. The survey mission is to develop, analyze and maintain renewable forest resource information. This information is essential for formulation of forest policies and programs.

ACKNOWLEDGMENTS

The Southern Station gratefully acknowledges the cooperation and assistance provided by the Oklahoma Division of Forestry and forest industries in collecting field data. Appreciation is also expressed for the cooperation of other public agencies and other private landowners in providing access to the sample locations.

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INTRODUCTION

These tables were derived from data obtained during a 1986 inventory of east Oklahoma (fig. 1). The data on forest acreage and timber volume were secured by a systematic sampling method involving a forest-nonforest classification on aerial photographs and on-the-ground measurement of trees at sample locations. The sample locations were at the intersections of a grid of lines spaced 3 miles apart. At each forest location, per acre estimates were obtained from 10 Basal Area 37.5 point samples.

The sampling methods were developed to provide suitable estimates for east Oklahoma. Estimates for smaller areas are presented, but

sampling error increases as the area considered decreases. Sampling errors given in Table I are based on one standard deviation or a probability of two chances out of three. To estimate the sampling error for a combination of counties one can use the following:

$$SE_g = \frac{SE_t \sqrt{X_t}}{\sqrt{X_g}}$$

where:

SE = standard error of estimate
(expressed as a percent)

X = variable of interest (area or volume)

g = group of counties to be combined

t = total for the unit

Table I - *Sampling errors¹ for timberland, growing stock, and sawtimber, East Oklahoma, 1986*

County	Timberland	Growing stock			Sawtimber volume
		Volume	Growth	Removals	
----- Percent -----					
Adair	2.6	11.5	13.5	40.7	14.4
Atoka ³	2.6	14.7	22.7	21.0	18.8
Bryan	1.7	19.9	²	35.9	23.1
Cherokee	3.1	22.2	15.5	19.0	25.1
Choctaw	2.7	13.9	19.5	15.6	17.6
Delaware ⁴	2.1	10.7	24.3	22.9	13.6
Haskell	3.6	²	²	...	²
Latimer	3.5	8.8	17.6	23.4	10.8
Le Flore	1.6	8.0	11.7	15.1	10.7
McCurtain	0.9	8.7	9.8	9.4	11.2
McIntosh	3.8	36.5	41.0	26.5	44.6
Mayes	2.2	26.3	²	...	29.1
Muskogee	3.5	18.7	15.2	48.6	23.7
Pittsburg	4.8	20.9	²	²	24.3
Pushmataha	1.6	6.3	8.8	13.2	8.3
Sequoyah	3.8	14.0	24.4	²	19.2
All counties	0.7	4.3	5.2	7.2	5.5

¹ By random-sampling formula.

² Sampling error greater than 50.

³ Coal included in Atoka.

⁴ Ottawa included in Delaware.

Tables 1-25 were developed to provide comparability among Forest Inventory and Analysis Projects. Tables 26-36 are supplementary tables and may change from unit to unit or state to state to address specific resource issues.

DEFINITION OF TERMS

Average annual gross growth. — Average annual net growth plus average annual mortality.

Average net annual growth. — Average net annual volume increase for the inter-survey period.

Average annual mortality. — Average annual sound-wood volume of live trees dying from natural causes.

Average annual removals. — Average annual net volume of growing-stock trees removed from the inventory by harvesting, cultural operations (such as timber-stand improvement), land clearing, or changes in land use.

Forest type. — A classification of forest land based upon the species forming a plurality of live-tree stocking.

Growing-stock trees. — Live trees of commercial species. Rough and rotten trees are excluded.

Growing-stock volume. — The cubic-foot volume of sound wood in growing-stock trees at least 5.0 inches in diameter at breast height, from a 1-foot stump to a minimum 4.0-inch top diameter outside bark of the central stem, or to the point where the central stem breaks into limbs.

Noncommercial species. — Tree species of typically small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products.

Poletimber trees. — Growing-stock trees of commercial species at least 5.0 inches in diame-

ter at breast height, but smaller than sawtimber size.

Rotten trees. — Live trees of commercial species that do not contain at least one 12-foot saw log, now or prospectively, primarily because of rot.

Reserved timberland. — Productive public forest land withdrawn from timber utilization through statute or administrative regulations.

Rough trees. — Live trees of commercial species that do not contain at least one 12-foot saw log, now or prospectively, primarily because of roughness or poor form. Also included are all live trees of noncommercial species.

Sawtimber trees. — Live trees that are of commercial species, contain at least a 12-foot saw log, and meet regional specifications for freedom from defect. Softwoods must be at least 9.0 inches in diameter at breast height and hardwoods at least 11.0 inches in diameter at breast height.

Sawtimber volume. — Sound-wood volume of the saw-log portion of live sawtimber trees in board feet, International 1/4-inch rule and in cubic feet.

Site class. — A classification of forest land in terms of inherent capacity to grow crops of industrial wood.

Stand-size class. — A classification of forest land based on the size class of growing-stock trees on the sampled area; that is, sawtimber, poletimber, or sapling and seedling.

Timberland. — Forest land that is producing, or is capable of producing, crops of industrial wood and not withdrawn from timber utilization. Timberland is synonymous with "commercial forest land" in prior reports.

Tree grade. — A classification of the volume of the saw-log portion of sawtimber trees, based on the log grade of the butt log.

Woodland. — Forest land incapable of yielding crops of industrial wood because of adverse site conditions.

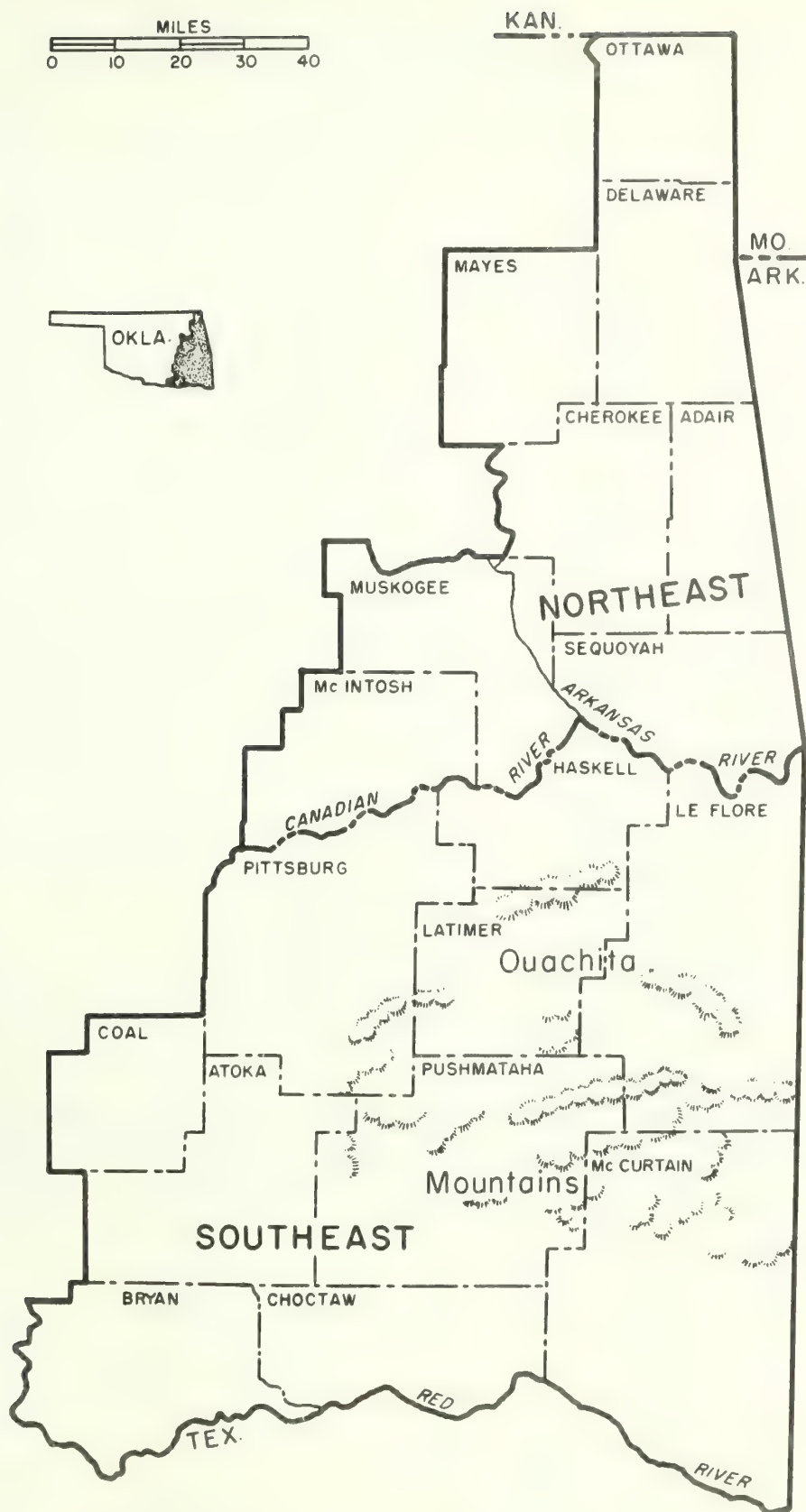


Figure 1.--The Forest Survey regions of East Oklahoma.

Table 1 — Area by county and land class, East Oklahoma, 1986

County	All land ¹	Forest land			Reserved timberland	Nonforest land
		Total	Timberland ²	Woodland ³		
----- Thousand acres -----						
Adair	369.1	205.6	205.6	...	...	163.5
Atoka ⁴	967.2	390.6	318.1	63.6	8.9	576.6
Bryan	603.2	134.6	134.6	...	...	468.5
Cherokee	497.2	277.3	257.9	19.3	...	220.0
Choctaw	512.1	178.1	164.4	13.7	...	334.0
Coal ⁴	...	...	...	...	...	...
Delaware ⁵	816.5	270.2	270.2	...	...	546.3
Haskell	400.6	168.6	153.3	15.3	...	232.0
Latimer	466.6	344.1	305.2	39.0	...	122.5
Le Flore	1029.0	645.8	639.8	6.0	...	383.1
McCurtain	1216.4	892.5	878.5	...	14.1	323.9
McIntosh	455.4	114.6	82.7	31.8	...	340.8
Mayes	437.3	130.5	130.5	...	...	306.8
Muskogee	535.9	138.4	102.5	35.9	...	397.6
Ottawa ⁵	...	...	...	...	...	...
Pittsburg	882.4	395.7	177.4	218.3	...	486.7
Pushmataha	910.8	722.0	710.1	11.9	...	188.8
Sequoyah	457.7	247.8	216.8	31.0	...	210.0
All counties	10557.3	5256.4	4747.5	485.9	23.0	5301.0

¹ From U.S. Bureau of the Census.

² Forest land (formerly termed commercial forest land) that is producing or capable of producing at least 20 cubic feet of industrial wood per acre per year. Includes areas that may be inaccessible or inoperable by current standards. Excludes reserved timberlands.

³ Forest land incapable of producing 20 cubic feet of industrial wood per acre per year under natural conditions because of adverse site condition.

⁴ Coal included in Atoka.

⁵ Ottawa included in Delaware.

Table 2 — Area of timberland by county and ownership class, East Oklahoma, 1986

County	All ownerships	National forest	Misc. federal	State	County and municipal	Forest industry ¹	Farmer	Corporate ²	Individual ²
----- Thousand acres -----									
Adair	205.6	...	...	...	...	...	118.4	24.9	62.3
Atoka ³	318.1	...	12.7	6.4	...	...	171.8	6.4	120.9
Bryan	134.6	...	7.1	...	...	...	106.3	...	21.3
Cherokee	257.9	...	19.3	32.2	...	...	154.8	...	51.6
Choctaw	164.4	...	13.7	...	...	...	77.6	4.6	68.5
Delaware ⁴	270.2	...	...	6.6	6.6	...	98.9	52.7	105.5
Haskell	153.3	...	10.2	...	...	...	66.4	10.2	66.4
Latimer	305.2	...	...	26.0	...	...	32.5	6.5	240.2
Le Flore	639.8	175.0	18.1	...	...	108.6	60.4	6.0	271.6
McCurtain	878.5	67.6	39.4	...	...	596.9	78.8	5.6	90.1
McIntosh	82.7	...	12.7	...	...	...	25.5	6.4	38.2
Mayes	130.5	...	20.6	6.9	...	...	27.5	13.7	61.8
Muskogee	102.5	...	35.9	...	...	...	20.5	10.2	35.9
Pittsburg	177.4	...	6.8	6.8	...	...	68.2	20.5	75.0
Pushmataha	710.1	...	...	29.8	...	346.1	101.4	23.9	208.8
Sequoyah	216.8	...	24.8	...	...	...	86.7	24.8	80.5
All counties	4747.5	242.6	221.4	114.7	6.6	1051.6	1295.6	216.4	1598.6

¹ Includes land leased to forest industry.² Indian land will be classed as corporate or individual as defined by the Bureau of Indian Affairs.³ Coal included in Atoka.⁴ Ottawa included in Delaware.**Table 3 — Area of timberland by county and forest type group, East Oklahoma, 1986**

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress	Elm-ash- cottonwood
		Planted	Natural				
-----Thousand acres-----							
Adair	205.6	...	12.5	6.2	186.9	...	...
Atoka ¹	318.1	...	57.3	19.1	140.0	76.3	25.4
Bryan	134.6	...	...	...	113.4	21.3	...
Cherokee	257.9	...	6.4	12.9	225.7	6.4	6.4
Choctaw	164.4	...	13.7	18.3	109.6	22.8	...
Delaware ²	270.2	...	...	6.6	257.0	6.6	...
Haskell	153.3	...	...	25.5	86.9	25.5	15.3
Latimer	305.2	...	58.4	84.4	155.8	6.5	...
Le Flore	639.8	36.2	102.6	169.0	289.7	36.2	6.0
McCurtain	878.5	180.2	168.9	191.5	281.6	56.3	...
McIntosh	82.7	...	...	...	63.6	6.4	12.7
Mayes	130.5	...	6.9	...	109.9	13.7	...
Muskogee	102.5	...	...	...	87.1	15.4	...
Pittsburg	177.4	...	20.5	20.5	95.5	40.9	...
Pushmataha	710.1	47.7	244.6	190.9	214.8	11.9	...
Sequoyah	216.8	...	...	12.4	179.6	12.4	12.4
All counties	4747.5	264.2	691.8	757.3	2597.1	358.8	78.4

¹ Coal included in Atoka.² Ottawa included in Delaware.

Table 4 - Area of timberland by county and stand-size class, East Oklahoma, 1986

County	All classes	Stand-size class			Nonstocked ¹ areas
		Sawtimber	Poletimber	Sapling- seedling	
----- Thousand acres -----					
Adair	205.6	87.2	99.7	12.5	6.2
Atoka ²	318.1	76.3	114.5	101.8	25.4
Bryan	134.6	28.3	35.4	56.7	14.2
Cherokee	257.9	70.9	129.0	51.6	6.4
Choctaw	164.4	45.7	50.2	50.2	18.3
Delaware ³	270.2	33.0	105.5	85.7	46.1
Haskell	153.3	20.4	51.1	35.8	46.0
Latimer	305.2	103.9	110.4	71.4	19.5
Le Flore	639.8	144.9	265.6	156.9	72.4
McCurtain	878.5	236.5	242.1	366.0	33.8
McIntosh	82.7	12.7	6.4	57.3	6.4
Mayes	130.5	27.5	34.3	27.5	41.2
Muskogee	102.5	20.5	56.4	...	25.6
Pittsburg	177.4	34.1	40.9	54.6	47.8
Pushmataha	710.1	202.9	220.8	262.5	23.9
Sequoyah	216.8	24.8	99.1	49.6	43.4
All counties	4747.5	1169.6	1661.3	1440.0	476.6

¹ Timberland less than 16.7 percent stocked.

² Coal included in Atoka.

³ Ottawa included in Delaware.

Table 5 - Area of timberland by county and site class, East Oklahoma, 1986

County	All classes	Site class (cubic feet/acre/year)				
		>165	120-165	85-120	50-85	<50
----- <i>Thousand acres</i> -----						
Adair	205.6	...	...	...	124.6	81.0
Atoka ¹	318.1	...	...	12.7	165.4	140.0
Bryan	134.6	...	7.1	...	42.5	85.0
Cherokee	257.9	...	6.4	19.3	103.2	129.0
Choctaw	164.4	...	...	18.3	68.5	77.6
Delaware ²	270.2	...	...	6.6	118.6	145.0
Haskell	153.3	5.1	10.2	5.1	46.0	86.9
Latimer	305.2	...	6.5	...	155.8	142.8
Le Flore	639.8	...	12.1	24.1	325.9	277.6
McCurtain	878.5	11.3	78.8	191.5	506.8	90.1
McIntosh	82.7	...	...	...	38.2	44.5
Mayes	130.5	...	...	6.9	48.1	75.6
Muskogee	102.5	...	...	5.1	35.9	61.5
Pittsburg	177.4	...	...	6.8	81.9	88.7
Pushmataha	710.1	...	6.0	71.6	411.7	220.8
Sequoyah	216.8	...	...	18.6	86.7	111.5
All counties	4747.5	16.4	127.1	386.6	2359.8	1857.6

¹ Coal included in Atoka.

² Ottawa included in Delaware.

Table 6 – Area of timberland by county and stocking classes of growing-stock trees, East Oklahoma, 1986

County	All classes	Stocking class (percent)				
		>130	100-130	60-100	16.7-60	<16.7
----- Thousand acres -----						
Adair	205.6	...	...	81.0	118.4	6.2
Atoka ¹	318.1	...	6.4	76.3	209.9	25.4
Bryan	134.6	...	7.1	14.2	99.2	14.2
Cherokee	257.9	...	12.9	103.2	135.4	6.4
Choctaw	164.4	...	4.6	22.8	118.7	18.3
Delaware ²	270.2	...	...	19.8	204.3	46.1
Haskell	153.3	...	5.1	15.3	86.9	46.0
Latimer	305.2	...	26.0	71.4	188.3	19.5
Le Flore	639.8	18.1	42.3	235.4	271.6	72.4
McCurtain	878.5	16.9	107.0	473.0	247.8	33.8
McIntosh	82.7	...	...	25.5	50.9	6.4
Mayes	130.5	...	...	...	89.3	41.2
Muskogee	102.5	...	...	25.6	51.2	25.6
Pittsburg	177.4	...	...	13.6	116.0	47.8
Pushmataha	710.1	6.0	83.5	340.1	256.6	23.9
Sequoyah	216.8	...	...	31.0	142.5	43.4
All counties	4747.5	41.0	294.8	1548.2	2387.0	476.6

¹ Coal included in Atoka.

² Ottawa included in Delaware.

Table 7 – Area of timberland by forest type and ownership class, East Oklahoma, 1986

Forest type ¹	All ownerships	National forest	Other public	Forest industry	Forest industry- leased	Other private
	----- <i>Thousand acres</i> -----					
Loblolly-shortleaf pine	956.0	106.2	42.2	492.6	...	314.9
Softwood total	956.0	106.2	42.2	492.6	...	314.9
Oak-pine	757.3	60.0	36.5	294.9	...	365.9
Oak-hickory	2597.1	65.2	189.2	235.7	5.6	2101.5
Oak-gum-cypress	358.8	11.3	45.6	22.9	...	279.0
Elm-ash-cottonwood	78.4	...	29.1	...	...	49.2
Hardwood total	3791.5	136.4	300.4	553.4	5.6	2795.6
All types	4747.5	242.6	342.7	1046.0	5.6	3110.6

¹ Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

Table 8 - Area of timberland by ownership and stocking classes of growing-stock trees, East Oklahoma, 1986

Ownership class	All classes	Stocking class (percent)				
		>130	100-130	60-100	16.7-60	<16.7
----- <i>Thousand acres</i> -----						
National forest	242.6	12.1	41.0	129.6	60.0	...
Other public	342.7	...	22.0	85.2	217.1	18.4
Forest industry	1046.0	17.2	145.2	543.3	305.7	34.5
Forest industry-leased	5.6	5.6	...	...	...	...
Other private	3110.6	6.0	86.5	790.2	1804.2	423.6
All ownerships	4747.5	41.0	294.8	1548.2	2387.0	476.6

Table 9 - Area of timberland by forest type and stand-size class, East Oklahoma, 1986

Forest type ¹	All classes	Stand-size class			Nonstocked ² areas
		Sawtimber	Poletimber	Sapling- seedling	
----- Thousand acres -----					
Loblolly-shortleaf pine	956.0	411.9	231.6	312.5	...
Softwood total	956.0	411.9	231.6	312.5	...
Oak-pine	757.3	225.5	225.6	300.1	6.0
Oak-hickory	2597.1	370.9	1087.5	726.8	412.0
Oak-gum-cypress	358.8	137.1	99.1	64.0	58.6
Elm-ash-cottonwood	78.4	24.3	17.5	36.6	...
Hardwood total	3791.5	757.7	1429.7	1127.5	476.6
All types	4747.5	1169.6	1661.3	1440.0	476.6

¹ Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood type.

² Timberland less than 16.7 percent stocked.

Table 10 – Number of live trees on timberland by species and diameter class, East Oklahoma, 1986

Species	Diameter class (inches at breast height)												
	All classes	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
----- Thousand trees -----													
Shortleaf-loblolly pine	649464	344058	164456	64138	31706	20113	14035	6735	2658	1025	294	246	...
Cypress	89	...	...	...	77	...	...	...	...	12	...	...	...
Other softwoods	39726	28509	7009	2373	1188	410	82	105	15	27	8	...	...
Total softwoods	689279	372567	171465	66511	32971	20523	14117	6840	2673	1064	302	246	...
Select white oaks	110578	57040	28640	10836	5531	3952	1673	1241	800	407	237	208	15
Select red oaks	42876	19483	8491	6243	2990	2083	1476	753	446	414	183	244	71
Other white oaks	487613	226896	144162	53732	28116	14871	8811	5880	2574	1225	663	683	...
Other red oaks	213859	114244	48030	17406	11696	8167	5271	3653	2264	1459	739	880	48
Hickory	334551	201469	73437	30600	14850	7341	3318	2000	840	379	127	169	19
Hard maple	4786	3493	516	185	165	215	54	131	18	...	...	8	...
Soft maple	65093	48064	12120	2604	620	436	471	291	256	64	90	57	19
Sweetgum	24670	16155	4623	1781	823	446	306	259	160	61	10	41	4
Tupelo-blackgum	33739	24134	5585	1707	913	363	359	297	231	38	63	49	...
Ash	55619	30322	10985	6054	3835	1906	1182	506	397	214	96	118	4
Cottonwood-aspen	10099	7383	568	541	631	330	198	111	30	52	63	186	6
Basswood	189	...	...	77	54	33	25	...	...	...	...	...	...
Black walnut	7743	4202	2416	350	125	342	83	134	15	14	40	18	4
Other hardwoods	490924	356091	83291	28053	10632	6680	2694	1735	862	336	250	246	53
Total hardwoods	1882340	1108976	422866	160170	80982	47167	25921	16992	8893	4663	2560	2909	242
Noncommercial	303375	205605	57156	19419	10582	6279	2013	1265	584	333	88	49	...
All species	2874993	1687148	651487	246101	124535	73969	42051	25097	12150	6061	2950	3204	242

Table 11 - Number of growing-stock trees on timberland by species and diameter class, East Oklahoma, 1986

Species	Diameter class (inches at breast height)												
	All classes	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
----- Thousand trees -----													
Shortleaf-loblolly pine	459634	190883	137034	58194	30062	19429	13444	6539	2613	962	243	231	...
Other softwoods	35676	26416	6590	1534	802	173	63	86	...	13	...	...	...
Total softwoods	495310	217299	143624	59728	30864	19602	13507	6625	2613	975	243	231	...
Select white oaks	49126	17892	14431	7394	4427	2762	945	572	353	191	73	83	3
Select red oaks	18704	3312	5695	3954	2051	1620	861	495	251	204	85	138	39
Other white oaks	182635	43221	71081	34763	18266	8163	3429	2160	970	340	123	118	...
Other red oaks	100820	38947	27396	11982	9291	5584	3106	2128	1106	693	351	225	10
Hickory	100934	39206	29644	16961	7926	3888	1644	1012	418	110	32	89	3
Hard maple	114	...	...	...	...	42	27	45	...	...	...	...	...
Soft maple	12545	6544	4144	996	348	221	94	81	57	...	59	...	...
Sweetgum	10697	5724	2484	1066	416	363	255	222	95	48	...	24	...
Tupelo-blackgum	8505	3803	2774	675	467	214	179	232	116	12	33	...	...
Ash	20851	6965	6530	2938	2152	890	641	306	204	149	52	23	...
Cottonwood-aspen	2611	568	...	451	631	330	198	111	30	52	63	173	4
Basswood	54	...	...	...	54	...	...	...	...	...	...	...	...
Black walnut	249	...	...	...	73	37	33	49	15	14	11	18	...
Other hardwoods	73174	33623	19497	9761	4320	3535	1110	697	385	55	120	65	5
Total hardwoods	581019	199805	183677	90942	50421	27650	12521	8111	4002	1868	1002	956	63
All species	1076329	417104	327301	150670	81285	47252	26028	14736	6615	2843	1245	1187	63

Table 12 – Volume of growing stock on timberland by species and diameter class, East Oklahoma, 1986

Species	Diameter class (inches at breast height)										
	All classes	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million cubic feet -----											
Shortleaf-loblolly pine	986.6	116.5	154.0	199.6	208.6	149.8	79.7	40.3	14.7	23.4	...
Other softwoods	10.8	3.1	3.0	1.8	0.9	1.6	...	0.5	...	...	...
Total softwoods	997.4	119.6	157.0	201.3	209.5	151.4	79.7	40.8	14.7	23.4	...
Select white oaks	115.8	19.5	22.4	25.6	13.7	12.5	8.0	6.7	2.8	4.4	0.2
Select red oaks	88.5	8.9	10.4	14.4	12.2	9.8	7.5	6.7	4.1	8.6	6.0
Other white oaks	310.6	68.7	75.6	59.0	37.8	33.1	19.5	8.6	3.7	4.6	...
Other red oaks	272.3	24.5	42.5	45.7	42.0	40.0	27.0	22.6	15.3	11.9	0.9
Hickory	156.5	29.9	34.0	29.9	20.3	19.7	10.4	3.6	1.5	6.6	0.5
Hard maple	1.5	...	...	0.4	0.4	0.7	...	...	...	...	...
Soft maple	14.3	2.1	1.6	2.1	1.5	1.8	1.6	...	3.5	...	...
Sweetgum	24.0	2.1	2.3	3.2	4.9	5.2	3.2	1.5	...	1.7	...
Tupelo-blackgum	16.9	1.6	1.9	1.5	2.1	4.5	3.4	0.2	1.7	...	...
Ash	54.9	7.9	11.4	8.2	8.4	5.7	5.2	4.5	2.1	1.4	...
Cottonwood-aspen	40.9	0.8	3.2	3.2	3.3	2.7	1.3	3.0	5.0	17.9	0.6
Basswood	0.2	...	0.2	...	...	...	...	...	...	...	...
Black walnut	3.8	...	0.3	0.3	0.4	0.9	0.6	0.2	0.5	0.8	...
Other hardwoods	121.6	20.1	20.1	27.9	15.3	14.5	11.1	1.7	5.2	4.6	1.1
Total hardwoods	1221.7	186.0	225.9	221.3	162.2	151.0	98.8	59.5	45.5	62.3	9.2
All species	2219.1	305.5	382.9	422.6	371.7	302.4	178.4	100.3	60.2	85.8	9.2

Table 13 — Volume of growing stock in the saw-log portion of sawtimber¹ trees on timberland by species and diameter class, East Oklahoma, 1986

Species	Diameter class (inches at breast height)								
	All classes	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
----- Million cubic feet -----									
Shortleaf-loblolly pine	643.5	167.5	189.2	138.4	73.8	37.9	14.1	22.5	...
Other softwoods	4.0	1.4	0.7	1.5	...	0.4	...	...	...
Total softwoods	647.5	168.9	190.0	139.9	73.8	38.3	14.1	22.5	...
Select white oaks	40.9	...	10.8	10.4	7.1	6.1	2.4	3.8	0.2
Select red oaks	48.3	...	10.1	8.5	6.7	6.0	3.5	8.1	5.4
Other white oaks	96.5	...	33.4	29.8	17.9	7.8	3.4	4.1	...
Other red oaks	135.8	...	32.4	35.0	23.4	19.9	13.9	10.4	0.8
Hickory	52.6	...	16.2	16.9	9.1	3.0	1.4	5.5	0.5
Hard maple	1.1	...	0.4	0.7	...	...	...	...	...
Soft maple	7.2	...	1.0	1.5	1.4	...	3.3	...	...
Sweetgum	13.9	...	3.6	4.4	2.8	1.4	...	1.6	...
Tupelo-blackgum	10.1	...	1.7	3.6	3.1	0.2	1.5	...	...
Ash	23.9	...	6.8	5.0	4.6	4.3	1.9	1.4	...
Cottonwood-aspen	30.5	...	2.3	2.1	0.9	2.8	4.6	17.0	0.6
Black walnut	2.6	...	0.2	0.7	0.5	0.2	0.4	0.7	...
Other hardwoods	44.8	...	12.1	11.9	9.4	1.6	4.5	4.4	1.0
Total hardwoods	508.2	...	131.0	130.6	86.8	53.4	40.8	57.0	8.5
All species	1155.7	168.9	321.0	270.5	160.6	91.7	54.9	79.4	8.5

¹ That part of the bole of sawtimber trees between the 1-foot stump and the saw-log top, including the portion of the forks large enough to contain a saw log.

Table 14 – Volume of sawtimber on timberland by species and diameter class, East Oklahoma, 1986

Species	Diameter class (inches at breast height)								
	All classes	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
-----Million board feet-----									
Shortleaf-loblolly pine	3659.5	869.0	1046.7	810.5	456.4	237.1	92.5	147.4	...
Other softwoods	20.6	6.9	3.8	7.7	...	2.3	...	...	...
Total softwoods	3680.2	876.0	1050.4	818.2	456.4	239.4	92.5	147.4	...
Select white oaks	242.9	...	59.2	60.7	42.9	38.1	16.4	24.7	0.9
Select red oaks	290.0	...	55.6	48.3	39.7	37.9	23.3	51.7	33.5
Other white oaks	557.8	...	179.8	171.0	108.3	48.7	22.2	27.8	...
Other red oaks	801.3	...	172.7	200.4	139.4	123.8	88.9	70.5	5.5
Hickory	311.4	...	88.7	99.4	56.3	19.5	8.8	36.5	2.2
Hard maple	6.3	...	2.0	4.3	...	...	...	...	...
Soft maple	42.4	...	5.2	9.3	7.9	...	20.0	...	...
Sweetgum	80.4	...	20.7	24.6	17.2	8.2	...	9.6	...
Tupelo-blackgum	57.2	...	8.8	19.7	17.3	1.2	10.2	...	...
Ash	138.1	...	35.5	28.1	27.6	27.2	11.5	8.3	...
Cottonwood-aspen	197.3	...	13.2	12.3	5.9	18.1	32.2	112.3	3.4
Black walnut	16.8	...	1.0	3.6	3.4	1.4	2.9	4.5	...
Other hardwoods	266.4	...	67.1	71.0	57.8	9.8	29.2	27.6	3.8
Total hardwoods	3008.3	...	709.7	752.7	523.8	334.0	265.5	373.5	49.2
All species	6688.5	876.0	1760.1	1570.9	980.1	573.4	358.0	520.9	49.2

Table 15 — Volume of growing stock and sawtimber on timberland by county and species group, East Oklahoma, 1986

County	Growing Stock						Sawtimber							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard ²
----- Million cubic feet -----						----- Million board feet -----								
Adair	138.9	...	14.7	...	8.0	116.2	391.4	...	64.0	...	30.7	296.6		
Atoka ³	110.9	...	47.3	...	11.1	52.5	308.4	...	151.2	...	16.7	140.4		
Bryan	46.4	...	...	0.2	13.0	33.1	138.4	...	...	...	49.3	89.1		
Cherokee	149.5	...	12.4	...	24.8	112.3	416.6	...	46.1	...	71.0	299.5		
Choctaw	64.8	...	14.7	2.8	9.3	38.1	201.3	...	51.3	8.7	16.7	124.6		
Delaware ⁴	67.9	...	2.8	0.3	2.8	62.0	169.0	...	14.6	...	6.5	147.9		
Haskell	68.2	...	12.0	...	33.7	22.6	275.4	...	37.5	...	183.0	54.9		
Latimer	142.6	...	95.2	0.6	1.8	45.0	388.8	...	319.1	...	...	69.7		
Le Flore	299.7	3.4	159.4	2.8	25.9	108.2	779.2	2.2	536.8	3.8	45.1	191.2		
McCurtain	547.8	39.2	274.3	0.2	39.6	194.5	1912.2	75.2	1226.5	...	117.4	493.1		
McIntosh	26.7	...	...	0.2	6.2	20.3	75.1	...	...	...	21.2	53.9		
Mayes	37.9	...	5.4	...	8.5	24.0	118.0	...	14.8	...	34.3	69.0		
Muskogee	41.7	...	0.2	...	9.1	32.5	61.8	...	0.5	...	14.7	46.5		
Pittsburg	47.3	...	19.8	...	2.6	24.9	163.1	...	65.9	...	8.5	88.6		
Pushmataha	378.0	4.0	276.3	3.0	6.4	88.2	1186.6	3.9	1029.5	8.1	10.6	134.5		
Sequoyah	51.0	...	5.5	0.7	4.3	40.6	103.3	...	20.3	...	9.0	74.0		
All counties	2219.1	46.6	940.0	10.8	207.0	1014.7	6688.5	81.3	3578.3	20.6	634.7	2373.7		

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

³ Coal included in Atoka.

⁴ Ottawa included in Delaware.

Table 16 – Volume of timber on timberland by class of timber and species group, East Oklahoma, 1986

Class of timber	All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²
		Planted	Natural			
----- Million cubic feet -----						
Sawtimber trees:						
Saw-log portion	1155.7	15.1	628.3	4.0	104.9	403.3
Upper-stem portion	153.7	2.0	70.7	0.7	16.9	63.5
Total	1309.4	17.2	699.0	4.7	121.8	466.7
Poletimber trees	909.7	29.4	241.0	6.1	85.3	547.9
All growing-stock trees	2219.1	46.6	940.0	10.8	207.0	1014.7
Rough trees:						
Sawtimber size	347.1	1.7	13.4	2.2	48.0	281.7
Poletimber size	358.6	1.2	13.0	1.9	56.2	286.3
Total	705.7	2.9	26.4	4.1	104.3	568.0
Rotten trees:						
Sawtimber size	118.8	...	2.2	0.3	16.2	100.1
Poletimber size	19.4	...	...	...	2.0	17.3
Total	138.2	...	2.2	0.3	18.3	117.4
Salvable dead trees:						
Sawtimber size	12.9	1.0	3.5	...	2.2	6.2
Poletimber size	11.6	0.2	1.9	...	2.0	7.6
Total	24.6	1.1	5.4	...	4.2	13.8
All classes	3087.6	50.7	974.1	15.2	333.7	1714.0

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 17 - Volume of live trees and growing stock on timberland by ownership class and species group, East Oklahoma, 1986

Ownership class	Live trees						Growing stock							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard ²
----- Million cubic feet -----														
National forest	285.4	2.7	167.2	2.4	12.4	100.7	249.5	2.7	164.0	2.4	8.1	72.4		
Other public	248.3	...	58.2	0.6	59.3	130.3	175.7	...	56.4	0.2	46.5	72.6		
Forest industry	583.7	41.6	317.8	1.7	28.3	194.3	507.1	39.9	309.3	0.8	19.1	138.1		
Other private	1945.6	5.3	425.4	10.5	229.6	1274.8	1286.7	4.1	410.3	7.4	133.3	731.6		
All ownerships	3063.0	49.5	968.6	15.2	329.5	1700.1	2219.1	46.6	940.0	10.8	207.0	1014.7		

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 18 - Average net annual growth of growing stock and sawtimber on timberland by county and species group, East Oklahoma, 1986

County	Growing stock						Sawtimber							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard ²
----- Million cubic feet -----						----- Million board feet -----								
Adair	4.0	...	0.2	...	0.1	3.6	13.5	...	1.4	...	0.4	11.7		
Atoka ³	4.9	...	2.8	...	0.4	2.5	16.4	...	11.2	...	-1.0	6.2		
Bryan	0.6	...	...	...	0.2	0.8	4.9	...	...	...	1.2	3.6		
Cherokee	4.5	...	0.4	...	0.2	3.9	12.7	...	1.6	...	0.7	10.5		
Choctaw	3.0	...	1.2	0.1	0.3	1.4	11.7	...	4.4	0.3	0.2	6.9		
Delaware ⁴	2.2	...	0.1	...	...	2.1	8.3	...	0.7	...	0.1	7.4		
Haskell	3.4	...	0.7	...	2.0	0.7	21.5	...	2.6	...	15.7	3.2		
Latimer	4.2	...	3.2	0.1	...	0.9	13.1	...	12.6	...	...	0.6		
Le Flore	10.3	0.6	6.2	0.4	0.3	2.8	32.4	1.9	25.8	0.1	0.6	4.0		
McCurtain	22.8	6.3	9.6	...	0.8	6.1	90.4	17.2	49.0	0.1	3.6	20.5		
McIntosh	1.9	...	...	...	0.1	1.7	6.1	...	...	...	0.5	5.6		
Mayes	1.1	...	0.3	...	0.3	0.5	4.6	...	1.6	...	1.0	2.0		
Muskogee	2.4	...	...	...	0.3	2.1	4.3	...	...	...	-0.1	4.4		
Pittsburg	1.0	...	1.7	...	1.4	0.7	5.7	...	4.4	...	-4.0	5.4		
Pushmataha	14.5	1.4	9.8	0.1	0.3	3.0	57.4	3.5	48.3	0.1	0.8	4.7		
Sequoyah	3.7	...	0.7	0.1	0.5	2.4	8.2	...	2.0	...	1.6	4.6		
All counties	84.4	8.3	36.9	0.7	3.3	35.3	311.4	22.6	165.5	0.6	21.4	101.4		

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

³ Coal included in Atoka.

⁴ Ottawa included in Delaware.

Table 19 – Average annual removals of growing stock and sawtimber on timberland by county and species group, East Oklahoma, 1986

County	Growing stock						Sawtimber							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard
----- Million cubic feet -----						----- Million board feet -----								
Adair	0.3	...	...	...	...	0.3	0.8	...	...	...	...	...	0.8	
Atoka ³	4.3	...	1.0	...	0.4	2.9	14.5	...	3.7	...	1.5	...	9.3	
Bryan	0.5	...	...	...	...	0.5	1.4	...	...	...	...	...	1.4	
Cherokee	1.2	...	...	...	...	1.1	2.4	...	...	...	0.3	...	2.1	
Choctaw	2.9	...	0.3	...	0.8	1.9	8.9	...	0.6	...	2.1	...	6.1	
Delaware ⁴	1.4	...	...	...	...	1.3	3.4	...	0.2	...	0.2	...	3.0	
Haskell	...	...	...	...	...	...	...	...	...	...	...	...	...	
Latimer	0.2	...	...	...	...	0.2	0.3	...	0.1	...	...	...	0.3	
Le Flore	13.0	3.6	5.5	0.5	0.6	2.8	44.6	15.8	20.0	...	2.7	...	6.1	
McCurtain	38.5	22.1	5.0	0.1	1.5	9.8	143.5	91.2	17.7	0.4	5.1	...	29.0	
McIntosh	0.4	...	...	...	...	0.4	1.1	...	...	...	...	...	1.1	
Mayes	0.1	...	0.1	...	...	...	0.4	...	0.4	...	...	...	...	
Muskogee	0.3	...	...	...	...	0.2	0.4	...	...	...	...	...	0.4	
Pittsburg	1.0	...	...	...	...	0.9	1.3	...	...	...	...	...	1.3	
Pushmataha	15.2	8.3	4.5	...	0.2	2.2	45.5	26.1	14.4	0.2	0.6	...	4.2	
Sequoyah	4.9	...	3.3	...	1.1	0.5	17.0	...	13.3	...	2.5	...	1.3	
All counties	84.0	34.0	19.7	0.6	4.7	24.9	285.6	133.1	70.4	0.6	15.1	...	66.4	

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

³ Coal included in Atoka.

⁴ Ottawa included in Delaware.

Table 20 – Average net annual growth and average annual removals of growing stock on timberland by species, East Oklahoma, 1986

Species	Growth	Removals
----- Million cubic feet -----		
Yellow pines	45.2	53.8
Other softwoods	0.7	0.6
Total softwoods	45.9	54.4
Select white-red oaks	7.1	3.2
Other white-red oaks	21.7	17.0
Hickory	4.1	3.5
Hard maple	0.1	...
Sweetgum	0.6	1.4
Ash-walnut-black cherry	2.1	0.9
Other hardwoods	2.8	3.6
Total hardwoods	38.5	29.5
All species	84.4	83.9

Table 21 – Average net annual growth and average annual removals of sawtimber on timberland by species, East Oklahoma, 1986

Species	Growth	Removals
----- Million board feet -----		
Yellow pines	188.1	203.6
Other softwoods	0.6	0.6
Total softwoods	188.7	204.2
Select white-red oaks	22.0	8.8
Other white-red oaks	62.1	44.7
Hickory	9.0	10.8
Hard maple	0.5	...
Sweetgum	4.2	4.3
Ash-walnut-black cherry	8.3	1.5
Other hardwoods	16.7	11.4
Total hardwoods	122.7	81.5
All species	311.4	285.7

Table 22 — Average annual mortality of growing stock and sawtimber on timberland by species, East Oklahoma, 1986

Species	Growing stock	Sawtimber
	- - Million cubic feet - - -	- Million board feet - -
Yellow pines	2.8	8.2
Total softwoods	2.8	8.2
Select white-red oaks	1.2	3.4
Other white-red oaks	4.5	9.5
Hickory	2.1	6.6
Sweetgum	...	...
Ash-walnut-black cherry	0.6	1.2
Other hardwoods	5.7	19.8
Total hardwoods	14.1	40.6
All species	16.9	48.8

Table 23 — Average net annual growth and average annual removals of growing stock on timberland by ownership class and species group, East Oklahoma, 1986

Ownership class	Growth						Removals						
	Softwood					Hardwood	Softwood					Hardwood	
	All species	Pine			Other	Soft ¹	Hard ²	All species	Pine			Soft ¹	Hard ²
		Planted	Natural						Planted	Natural			
----- Million cubic feet -----													
National forest	7.5	0.4	5.0	0.3	0.1	1.9	4.3	1.2	1.1	0.4	...	1.6	
Other public	7.7	...	2.2	...	2.3	3.2	2.2	...	0.9	...	1.0	0.2	
Forest industry	22.0	7.6	9.9	...	0.1	4.5	50.7	32.5	7.4	0.1	1.6	9.1	
Other private	47.3	0.4	19.9	0.4	0.9	25.7	26.7	0.3	10.3	0.1	2.1	13.8	
All ownerships	84.5	8.3	36.9	0.7	3.3	35.3	83.9	34.0	19.7	0.6	4.7	24.8	

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 24 – Average net annual growth and average annual removals of sawtimber on timberland by ownership class and species group, East Oklahoma, 1986

Ownership class	Growth						Removals							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard ²
----- Million board feet -----														
National forest	32.7	0.6	25.6	0.1	-0.1	6.5	12.9	5.2	4.2	...	...	3.5		
Other public	33.1	...	8.8	...	16.2	8.1	4.5	...	2.3	...	1.8	0.3		
Forest industry	77.5	21.0	46.1	-0.1	0.6	10.0	183.3	126.4	28.7	0.2	5.6	22.4		
Other private	168.2	1.0	85.1	0.5	4.7	76.8	84.9	1.4	35.2	0.4	7.7	40.2		
All ownerships	311.6	22.6	165.5	0.6	21.4	101.5	285.6	133.1	70.4	0.6	15.1	66.4		

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 25 – Volume of sawtimber on timberland by species and tree grade, East Oklahoma, 1986

Species	All grades	Grade 1	Grade 2	Grade 3	Grade 4
----- Million board feet -----					
Yellow pines	3659.5	451.3	781.0	2427.3	...
Redcedar	20.6	20.6	...	...	...
Total softwoods	3680.2	471.9	781.0	2427.3	...
Select white-red oaks	532.9	52.0	134.3	198.2	148.4
Other white-red oaks	1359.1	45.5	190.3	603.7	519.7
Hickory	311.4	15.0	49.0	132.9	114.5
Hard maple	6.3	...	...	...	6.3
Sweetgum	80.4	4.4	23.7	36.7	15.6
Tupelo and blackgum	57.2	3.3	17.5	25.2	11.1
Ash-walnut-black cherry	160.4	36.9	42.5	72.7	8.3
Other hardwoods	500.6	155.1	122.2	161.0	62.3
Total hardwoods	3008.3	312.2	579.5	1230.4	886.2
All species	6688.5	784.1	1360.5	3657.7	886.2

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Table 26 — *Area of timberland by stand age, forest type group, and type of regeneration, East Oklahoma, 1986*

Stand age class	Pine		Oak-pine		Other hardwood types	
	Artificial	Natural	Artificial	Natural	Artificial	Natural
----- Thousand acres -----						
1-10	173.0	23.9	127.1	6.0	80.0	136.9
11-20	67.9	24.1	22.5	...	...	54.8
21-30	5.6	18.3	...	...	...	6.0
31-40	...	59.0	...	6.0	...	44.0
41-50	...	24.4	...	6.0	...	86.8
>50	...	12.8	...	6.0	...	43.8
Mixed	17.6	529.2	23.3	560.4	...	2582.0
All classes	264.2	691.8	172.9	584.4	80.0	2954.3

Table 27 — *Volume of softwood growing stock on timberland by forest type, East Oklahoma, 1986*

County	Total	Forest type group			
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory
		Planted	Natural		
----- Million cubic feet -----					
Adair	14.7	...	9.3	3.6	1.8
Atoka ¹	47.3	...	40.6	4.2	2.5
Bryan	0.2	...	...	...	0.2
Cherokee	12.4	...	7.6	2.3	2.5
Choctaw	17.4	...	8.5	5.2	3.8
Delaware ²	3.1	...	...	...	3.1
Haskell	12.0	...	...	10.4	1.5
Latimer	95.8	...	52.5	30.5	12.8
Le Flore	165.6	3.2	94.4	53.0	15.0
McCurtain	313.7	33.0	195.1	62.7	22.9
McIntosh	0.2	...	...	...	0.2
Mayes	5.4	...	5.4	...	...
Muskogee	0.2	...	...	...	0.2
Pittsburg	19.8	...	14.0	4.8	1.0
Pushmataha	283.4	2.1	215.8	56.1	9.4
Sequoyah	6.1	...	...	5.5	0.7
All counties	997.4	38.3	643.2	238.3	77.6

¹ Coal included in Atoka.

² Ottawa included in Delaware.

Table 28 – *Volume of hardwood growing stock on timberland by forest type, East Oklahoma, 1986*

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress	Elm-ash- cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Adair	124.2	...	2.5	2.6	119.0	...	...
Atoka ¹	63.5	...	1.9	1.2	21.0	33.3	6.1
Bryan	46.1	...	...	...	25.9	20.3	...
Cherokee	137.1	...	...	2.9	109.4	13.7	11.0
Choctaw	47.3	...	2.0	1.8	38.0	5.5	...
Delaware ²	64.8	...	...	0.3	63.2	1.3	...
Haskell	56.3	...	...	1.8	8.3	16.0	30.2
Latimer	46.8	...	5.0	12.7	25.1	4.0	...
Le Flore	134.1	0.2	7.8	19.2	80.0	17.6	9.2
McCurtain	234.1	1.5	23.6	36.0	121.1	51.9	...
McIntosh	26.5	...	...	...	22.8	1.9	1.8
Mayes	32.5	...	0.7	...	22.1	9.7	...
Muskogee	41.5	...	...	...	33.5	8.1	...
Pittsburg	27.5	...	0.2	0.2	15.6	11.4	...
Pushmataha	94.6	...	23.4	28.7	39.6	2.9	...
Sequoyah	44.9	...	...	3.4	39.7	1.1	0.7
All counties	1221.7	1.7	67.2	110.9	784.0	198.8	59.0

¹ Coal included in Atoka.

² Ottawa included in Delaware.

Table 29 – *Volume of softwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, East Oklahoma, 1986*

County	Total	Forest type group			
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory
		Planted	Natural		
----- Million cubic feet -----					
Adair	11.9	...	7.4	3.2	1.3
Atoka ¹	27.5	...	24.1	1.9	1.4
Bryan	...	...	...	...	...
Cherokee	8.4	...	5.2	1.0	2.2
Choctaw	11.3	...	5.9	3.2	2.3
Delaware ²	2.4	...	...	...	2.4
Haskell	6.9	...	...	5.8	1.1
Latimer	59.3	...	31.0	20.1	8.3
Le Flore	97.9	0.4	56.3	33.4	7.8
McCurtain	218.6	13.2	145.5	42.1	17.8
McIntosh	...	...	...	...	...
Mayes	2.6	...	2.6	...	...
Muskogee	0.1	...	...	...	0.1
Pittsburg	11.7	...	8.5	2.7	0.5
Pushmataha	185.3	0.4	144.5	34.6	5.8
Sequoyah	3.7	...	...	3.7	...
All counties	647.5	14.0	430.9	151.6	51.0

¹ Coal included in Atoka.

² Ottawa included in Delaware.

Table 30 — *Volume of hardwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, East Oklahoma, 1986*

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum cypress	Elm-ash cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Adair	57.6	...	1.1	1.9	54.7	...	...
Atoka ¹	26.6	...	1.3	...	4.7	16.6	4.0
Bryan	23.1	...	...	...	11.4	11.7	...
Cherokee	64.5	...	...	1.3	46.1	10.5	6.7
Choctaw	24.1	...	0.6	0.5	19.2	3.8	...
Delaware ²	24.9	...	...	...	24.3	0.6	...
Haskell	37.4	...	...	0.2	2.1	9.5	25.6
Latimer	12.4	...	0.8	3.8	5.9	2.0	...
Le Flore	39.5	...	1.9	5.7	22.3	7.6	2.0
McCurtain	103.8	0.9	9.2	16.7	40.5	36.5	...
McIntosh	12.2	...	...	...	10.7	0.4	1.2
Mayes	16.7	...	...	...	10.9	5.8	...
Muskogee	10.3	...	...	...	6.5	3.8	...
Pittsburg	15.9	...	0.2	...	7.0	8.7	...
Pushmataha	24.8	...	6.7	7.4	8.9	1.8	...
Sequoyah	14.2	...	...	0.9	12.8	0.2	0.2
All counties	508.2	0.9	21.7	38.4	288.2	119.3	39.6

¹ Coal included in Atoka.

² Ottawa included in Delaware.

Table 31 — *Volume of timber on timberland by county, class of timber and species group, East Oklahoma, 1986*

County	All classes	Growing stock		Rough		Rotten	
		Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
----- Million cubic feet -----							
Adair	195.2	14.7	124.2	1.1	45.2	...	10.0
Atoka ¹	178.4	47.3	63.5	0.8	59.5	0.4	6.9
Bryan	82.3	0.2	46.1	0.4	32.6	...	3.0
Cherokee	207.8	12.4	137.1	...	46.6	...	11.7
Choctaw	91.6	17.4	47.3	0.6	24.1	...	2.2
Delaware ²	143.0	3.1	64.8	0.4	47.3	0.4	27.0
Haskell	99.2	12.0	56.3	0.5	27.4	0.2	2.9
Latimer	199.5	95.8	46.8	3.7	46.5	...	6.7
Le Flore	404.0	165.6	134.1	5.8	89.0	...	9.5
McCurtain	623.8	313.7	234.1	6.6	55.4	...	13.9
McIntosh	46.4	0.2	26.5	0.2	18.1	...	1.5
Mayes	81.7	5.4	32.5	0.7	21.0	...	22.0
Muskogee	70.6	0.2	41.5	...	26.6	...	2.3
Pittsburg	81.2	19.8	27.5	2.0	28.5	0.1	3.3
Pushmataha	472.6	283.4	94.6	10.2	74.4	1.3	8.8
Sequoyah	85.8	6.1	44.9	0.6	30.3	...	3.9
All counties	3063.0	997.4	1221.7	33.4	672.3	2.5	135.7

¹ Coal included in Atoka.

² Ottawa included in Delaware.

Table 32 — Number of live trees on timberland by detailed species and diameter class, East Oklahoma, 1986

Species	Diameter class (inches at breast height)												
	All classes	1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Thousand trees -----													
Shortleaf pine	523826	288622	115142	48479	29331	19182	13318	6247	2442	808	196	60	...
Loblolly pine	125638	55436	49315	15659	2375	932	716	488	216	217	98	186	...
Redcedar	39726	28509	7009	2373	1188	410	82	105	15	27	8	...	...
Cypress	89	...	...	...	77	...	...	...	...	12	...	...	...
Total softwoods	689279	372567	171465	66511	32971	20523	14117	6840	2673	1064	302	246	...
Select white oaks	110578	57040	28640	10836	5531	3952	1673	1241	800	407	237	208	15
Select red oaks	42876	19483	8491	6243	2990	2083	1476	753	446	414	183	244	71
Other white oaks	487613	226896	144162	53732	28116	14871	8811	5880	2574	1225	663	683	...
Other red oaks	213859	114244	48030	17406	11696	8167	5271	3653	2264	1459	739	880	48
Sweet pecan	6642	5219	...	564	272	99	155	92	31	68	55	72	15
Water hickory	4676	4647	...	...	...	...	...	...	...	13	12	5	...
Other hickories	323233	191604	73437	30036	14578	7242	3163	1908	809	299	60	93	4
Persimmon	21270	18452	1628	963	175	...	53	...	...	...	...	...	...
Hard maple	4786	3493	516	185	165	215	54	131	18	...	...	8	...
Soft maple	59909	46363	10044	2108	421	252	318	153	102	37	69	23	19
Boxelder	5184	1701	2077	496	199	184	154	138	154	27	21	34	...
Sweetgum	24670	16155	4623	1781	823	446	306	259	160	61	10	41	4
Blackgum	33739	24134	5585	1707	913	363	359	297	231	38	63	49	...
White ash	26280	17468	3098	2562	1295	830	406	260	172	76	41	71	...
Other ashes	29339	12854	7887	3492	2539	1076	776	245	225	138	54	47	4
Sycamore	2954	419	516	593	477	321	264	51	134	28	48	86	18
Cottonwood	10099	7383	568	541	631	330	198	111	30	52	63	186	6
Basswood	189	...	...	77	54	33	25	...	...	...	...	...	...
Willow	6889	4492	1549	280	220	71	25	88	81	26	33	24	...
Black walnut	7743	4202	2416	350	125	342	83	134	15	14	40	18	4
Black cherry	8997	7083	1107	240	123	301	92	20	31	...	...	...	...
American elm	20469	11684	4028	2106	872	608	560	358	108	42	54	35	16
Other elms	234241	165526	44125	14802	4811	3172	868	560	181	97	54	40	4
River birch	3622	2117	468	596	157	36	28	82	68	14	12	37	5
Hackberry	46257	31004	8266	3167	1576	1165	399	391	153	65	50	17	3
Black locust	6489	4178	1825	329	156	...	...	...	...	...	...	...	...
Other locusts	8322	4614	1137	614	1050	509	225	87	38	40	...	8	...
Sassafras	38706	36525	1145	831	70	98	36	...	...	...	...	...	...
Dogwood	59510	48191	10246	993	81	...	...	...	...	...	...	...	...
Holly	4833	4758	...	...	...	38	...	23	14	...	...	...	...
Other commercial	28365	17049	7251	2538	864	360	143	73	55	24	...	...	8
Total hardwoods	1882340	1108976	422866	160170	80982	47167	25921	16992	8893	4663	2560	2909	242
Noncommercial	303375	205605	57156	19419	10582	6279	2013	1265	584	333	88	49	...
All species	2874993	1687148	651487	246101	124535	73969	42051	25097	12150	6061	2950	3204	242

Table 33 — *Number of growing-stock trees on timberland by detailed species and diameter class, East Oklahoma, 1986*

Species	Diameter class (inches at breast height)										
	All classes	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
----- Thousand trees -----											
Shortleaf pine	112259	43645	27818	18662	12727	6051	2397	745	164	50	...
Loblolly pine	19458	14549	2244	767	716	488	216	217	79	181	...
Redcedar	2670	1534	802	173	63	86	...	13	...	...	...
Total softwoods	134387	59728	30864	19602	13507	6625	2613	975	243	231	...
Select white oaks	16803	7394	4427	2762	945	572	353	191	73	83	3
Select red oaks	9697	3954	2051	1620	861	495	251	204	85	138	39
Other white oaks	68333	34763	18266	8163	3429	2160	970	340	123	118	...
Other red oaks	34477	11982	9291	5584	3106	2128	1106	693	351	225	10
Sweet pecan	783	319	142	99	31	92	17	14	11	55	3
Water hickory	5	...	...	...	...	...	...	...	...	5	...
Other hickories	31296	16642	7784	3789	1613	920	401	96	21	29	...
Persimmon	666	640	...	...	25	...	...	...	...	...	...
Hard maple	114	...	...	42	27	45	...	...	...	...	...
Soft maple	1373	793	215	127	94	46	39	...	59	...	...
Boxelder	483	202	132	95	...	36	18	...	...	...	...
Sweetgum	2489	1066	416	363	255	222	95	48	...	24	...
Blackgum	1928	675	467	214	179	232	116	12	33	...	...
White ash	2456	1001	575	426	168	173	63	24	20	6	...
Other ashes	4899	1937	1578	464	473	133	141	125	32	16	...
Sycamore	1466	320	407	272	204	51	117	16	48	27	5
Cottonwood	2044	451	631	330	198	111	30	52	63	173	4
Basswood	54	...	54	...	...	...	...	...	...	...	...
Willow	313	155	...	30	...	40	65	13	11	...	...
Black walnut	249	...	73	37	33	49	15	14	11	18	...
Black cherry	435	112	123	130	33	20	17	...	...	...	...
American elm	2165	1160	211	358	182	138	53	15	30	16	...
Other elms	9741	5259	2142	1619	431	201	49	11	20	9	...
River birch	290	135	87	...	...	37	17	...	...	14	...
Hackberry	3317	1275	836	781	178	188	48	...	11	...	...
Black locust	102	102	...	...	...	...	...	...	...	...	...
Other locusts	678	...	342	240	56	22	19	...	...	...	...
Sassafras	532	407	70	54	...	...	...	...	...	...	...
Other commercial	349	196	102	51	...	...	...	...	...	...	...
Total hardwoods	197537	90942	50421	27650	12521	8111	4002	1868	1002	956	63
All species	331924	150670	81285	47252	26028	14736	6615	2843	1245	1187	63

Table 34 — *Volume of growing-stock trees on timberland by species and diameter class, East Oklahoma, 1986*

Species	Diameter class (inches at breast height)										
	All classes	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million cubic feet -----											
Shortleaf pine	875.8	94.7	145.4	191.1	195.8	136.6	71.2	29.1	8.3	3.6	...
Loblolly pine	110.8	21.8	8.5	8.5	12.8	13.2	8.4	11.2	6.4	19.9	...
Redcedar	10.8	3.1	3.0	1.8	0.9	1.6	...	0.5	...	...	...
Total softwoods	997.4	119.6	157.0	201.3	209.5	151.4	79.7	40.8	14.7	23.4	...
Select white oaks	115.8	19.5	22.4	25.6	13.7	12.5	8.0	6.7	2.8	4.4	0.2
Select red oaks	88.5	8.9	10.4	14.4	12.2	9.8	7.5	6.7	4.1	8.6	6.0
Other white oaks	310.6	68.7	75.6	59.0	37.8	33.1	19.5	8.6	3.7	4.6	...
Other red oaks	272.3	24.5	42.5	45.7	42.0	40.0	27.0	22.6	15.3	11.9	0.9
Sweet pecan	10.1	0.8	0.7	0.7	0.4	1.8	0.6	0.5	0.4	3.7	0.5
Water hickory	0.5	...	...	...	...	...	...	...	...	0.5	...
Other hickories	145.9	29.2	33.4	29.1	19.9	18.0	9.9	3.1	1.1	2.4	...
Persimmon	1.6	1.2	...	...	0.4	...	...	...	...	...	...
Hard maple	1.5	...	...	0.4	0.4	0.7	...	...	...	...	...
Soft maple	11.1	1.7	1.1	1.1	1.5	1.0	1.2	...	3.5	...	...
Boxelder	3.2	0.5	0.6	1.0	...	0.8	0.4	...	...	...	...
Sweetgum	24.0	2.1	2.3	3.2	4.9	5.2	3.2	1.5	...	1.7	...
Blackgum	16.9	1.6	1.9	1.5	2.1	4.5	3.4	0.2	1.7	...	...
White ash	16.8	2.8	2.4	3.4	2.0	3.0	1.4	0.7	0.9	0.2	...
Other ashes	38.1	5.1	9.0	4.9	6.4	2.7	3.7	3.8	1.2	1.2	...
Sycamore	23.8	1.3	3.0	3.1	4.3	1.4	4.0	0.6	2.5	2.7	1.1
Cottonwood	40.9	0.8	3.2	3.2	3.3	2.7	1.3	3.0	5.0	17.9	0.6
Basswood	0.2	...	0.2	...	...	...	...	...	...	...	...
Willow	4.1	0.2	...	0.2	...	1.0	1.9	0.3	0.4	...	...
Black walnut	3.8	...	0.3	0.3	0.4	0.9	0.6	0.2	0.5	0.8	...
Black cherry	2.9	0.3	0.6	0.9	0.4	0.4	0.4	...	...	...	...
American elm	14.3	2.0	0.8	2.9	2.2	2.4	1.3	0.4	1.5	0.7	...
Other elms	45.2	10.7	9.7	12.9	5.1	4.1	1.1	0.5	0.5	0.5	...
River birch	2.5	0.2	0.4	...	...	0.9	0.4	...	...	0.6	...
Hackberry	18.9	2.4	3.0	5.5	2.3	3.9	1.5	...	0.3	...	...
Black locust	0.3	0.3	...	...	...	...	...	...	...	...	...
Other locusts	5.1	...	1.6	1.9	0.6	0.4	0.5	...	...	...	...
Sassafras	1.4	0.8	0.4	0.3	...	...	...	...	...	...	...
Other commercial	1.4	0.7	0.5	0.3	...	...	...	...	...	...	...
Total hardwoods	1221.7	186.0	225.9	221.3	162.2	151.0	98.8	59.5	45.5	62.3	9.2
All species	2219.1	305.5	382.9	422.6	371.7	302.4	178.4	100.3	60.2	85.8	9.2

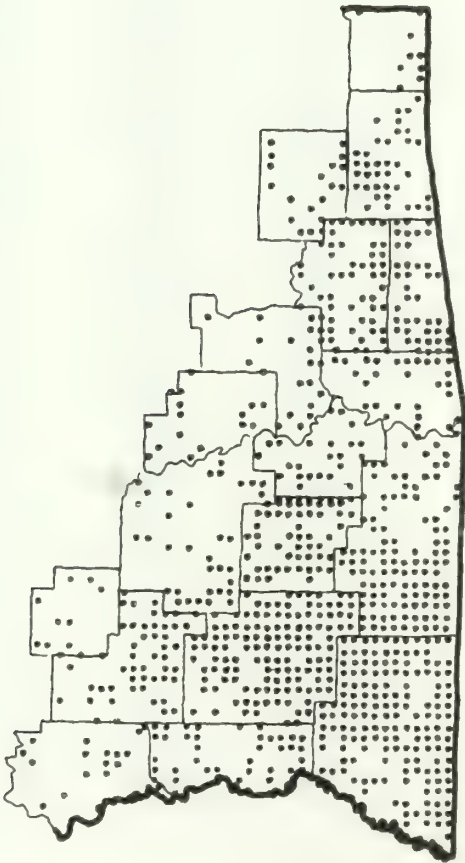
Table 35 – *Volume of growing stock in the saw-log portion of sawtimber trees on timberland by detailed species and diameter class, East Oklahoma, 1986*

Species	Diameter class (inches at breast height)								
	All classes	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
----- Million cubic feet -----									
Shortleaf pine	568.6	160.5	177.8	126.1	65.8	27.0	7.9	3.5	...
Loblolly pine	74.8	7.1	11.4	12.3	8.0	10.9	6.2	19.0	...
Redcedar	4.0	1.4	0.7	1.5	...	0.4	...	...	...
Total softwoods	647.5	168.9	190.0	139.9	73.8	38.3	14.1	22.5	...
Select white oaks	40.9	...	10.8	10.4	7.1	6.1	2.4	3.8	0.2
Select red oaks	48.3	...	10.1	8.5	6.7	6.0	3.5	8.1	5.4
Other white oaks	96.5	...	33.4	29.8	17.9	7.8	3.4	4.1	...
Other red oaks	135.8	...	32.4	35.0	23.4	19.9	13.9	10.4	0.8
Sweet pecan	6.4	...	0.3	1.6	0.4	0.4	0.4	2.8	0.5
Water hickory	0.5	...	...	...	...	...	...	0.5	...
Other hickories	45.7	...	16.0	15.3	8.7	2.6	0.9	2.2	...
Persimmon	0.3	...	0.3	...	...	...	...	...	...
Hard maple	1.1	...	0.4	0.7	...	...	...	...	...
Soft maple	6.1	...	1.0	0.9	1.0	...	3.3	...	...
Boxelder	1.1	...	...	0.7	0.4	...	...	...	...
Sweetgum	13.9	...	3.6	4.4	2.8	1.4	...	1.6	...
Blackgum	10.1	...	1.7	3.6	3.1	0.2	1.5	...	...
White ash	7.3	...	1.5	2.8	1.4	0.6	0.8	0.2	...
Other ashes	16.7	...	5.2	2.2	3.2	3.7	1.1	1.2	...
Sycamore	14.3	...	3.1	1.1	3.6	0.6	2.3	2.7	1.0
Cottonwood	30.5	...	2.3	2.1	0.9	2.8	4.6	17.0	0.6
Willow	2.7	...	...	0.6	1.6	0.2	0.3	...	...
Black walnut	2.6	...	0.2	0.7	0.5	0.2	0.4	0.7	...
Black cherry	1.0	...	0.3	0.4	0.3	...	...	...	...
American elm	7.3	...	1.9	2.1	1.1	0.4	1.2	0.5	...
Other elms	10.2	...	4.4	3.6	0.9	0.4	0.4	0.5	...
River birch	1.7	...	...	0.7	0.4	...	...	0.6	...
Hackberry	6.3	...	1.7	3.2	1.2	...	0.2	...	...
Other locusts	1.0	...	0.4	0.2	0.3	...	...	...	...
Total hardwoods	508.2	...	131.0	130.6	86.8	53.4	40.8	57.0	8.5
All species	1155.7	168.9	321.0	270.5	160.6	91.7	54.9	79.4	8.5

**Table 36 — Volume of timber on timberland by species and class of timber,
East Oklahoma, 1986**

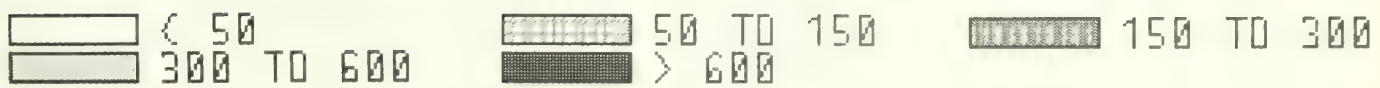
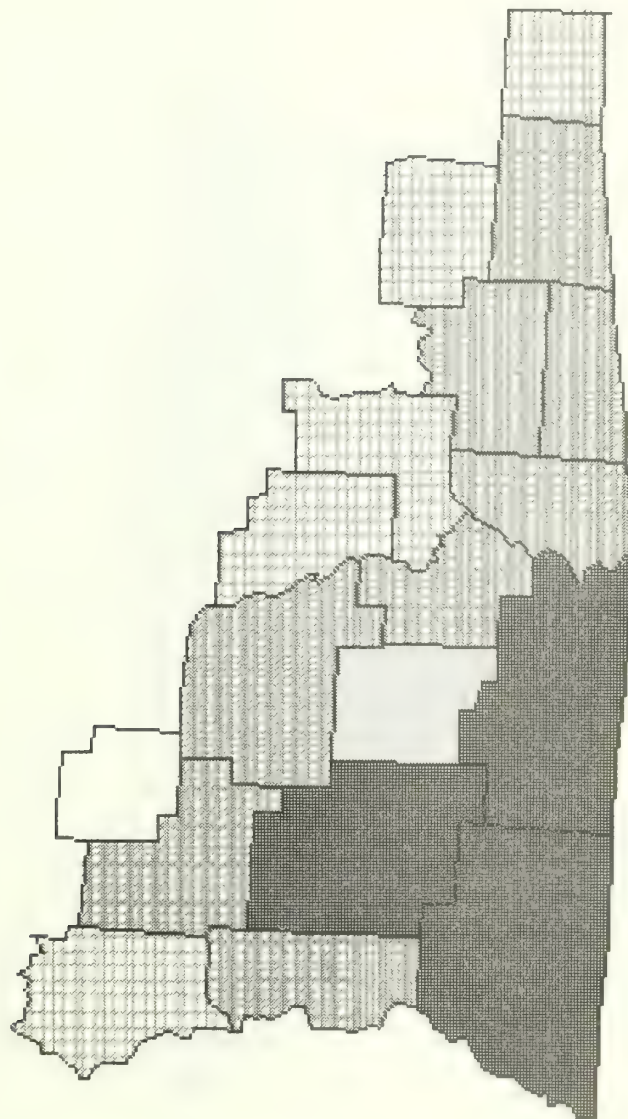
Species	All live	Growing stock	Rough	Rotten
----- Million cubic feet -----				
Shortleaf pine	902.9	875.8	24.9	2.2
Loblolly pine	115.3	110.8	4.5	...
Redcedar	14.8	10.8	3.7	0.3
Cypress	0.4	...	0.4	...
Total softwoods	1033.3	997.4	33.4	2.5
Select white oaks	161.0	115.8	37.2	8.0
Select red oaks	118.9	88.5	22.0	8.4
Other white oaks	515.6	310.6	169.3	35.6
Other red oaks	394.2	272.3	79.1	42.8
Sweet pecan	15.8	10.1	4.5	1.2
Water hickory	0.8	0.5	...	0.3
Other hickories	231.8	145.9	73.2	12.7
Persimmon	2.7	1.6	1.2	...
Hard maple	4.9	1.5	2.2	1.2
Soft maple	23.3	11.1	10.3	1.9
Boxelder	11.9	3.2	7.3	1.4
Sweetgum	31.1	24.0	5.0	2.1
Blackgum	25.9	16.9	5.2	3.8
White ash	31.6	16.8	13.9	0.8
Other ashes	56.3	38.1	16.3	1.9
Sycamore	30.6	23.8	5.2	1.6
Cottonwood	41.8	40.9	0.3	0.6
Basswood	0.7	0.2	0.3	0.3
Willow	8.2	4.1	4.0	0.2
Black walnut	7.9	3.8	3.4	0.6
Black cherry	4.7	2.9	1.1	0.7
American elm	28.3	14.3	12.1	1.8
Other elms	85.2	45.2	38.6	1.4
River birch	6.9	2.5	3.1	1.3
Hackberry	34.7	18.9	13.1	2.6
Black locust	0.9	0.3	0.2	0.4
Other locusts	13.3	5.1	7.5	0.6
Sassafras	2.4	1.4	0.5	0.4
Dogwood	0.9	...	0.9	...
Holly	0.4	...	0.2	0.2
Other commercial	9.2	1.4	7.0	0.8
Total hardwoods	1901.9	1221.7	544.5	135.7
Noncommercial	127.8	...	127.8	...
All species	3063.0	2219.1	705.7	138.2

EAST OKLAHOMA TIMBERLAND PLOT LOCATIONS

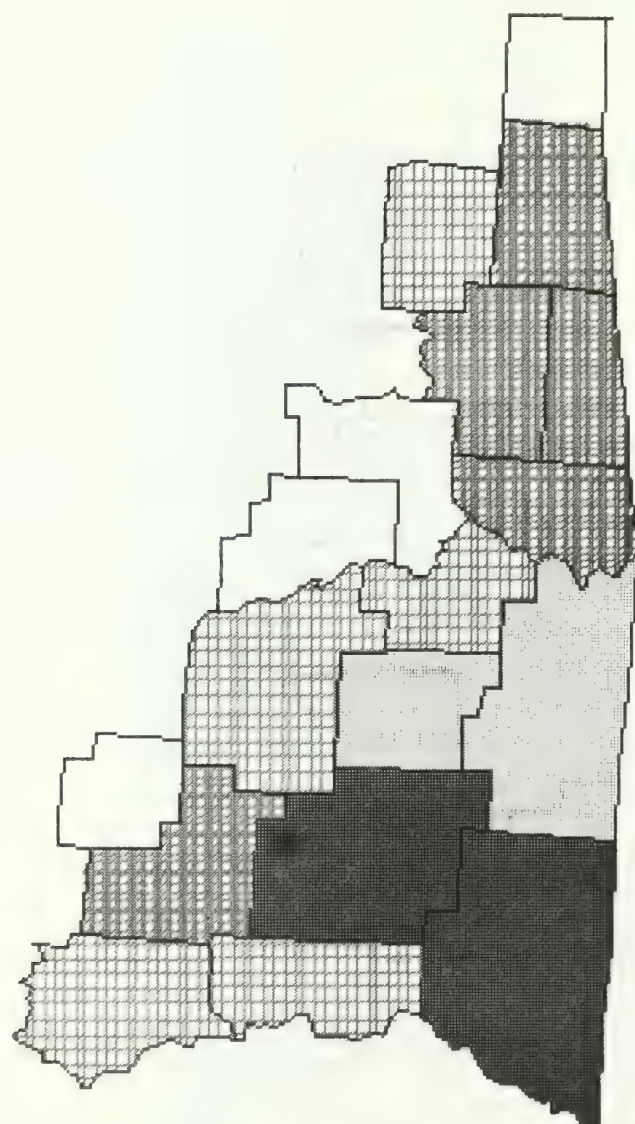


TOTAL TIMBERLAND BY COUNTY

(IN THOUSAND ACRES)



PERCENT TIMBERLAND BY COUNTY



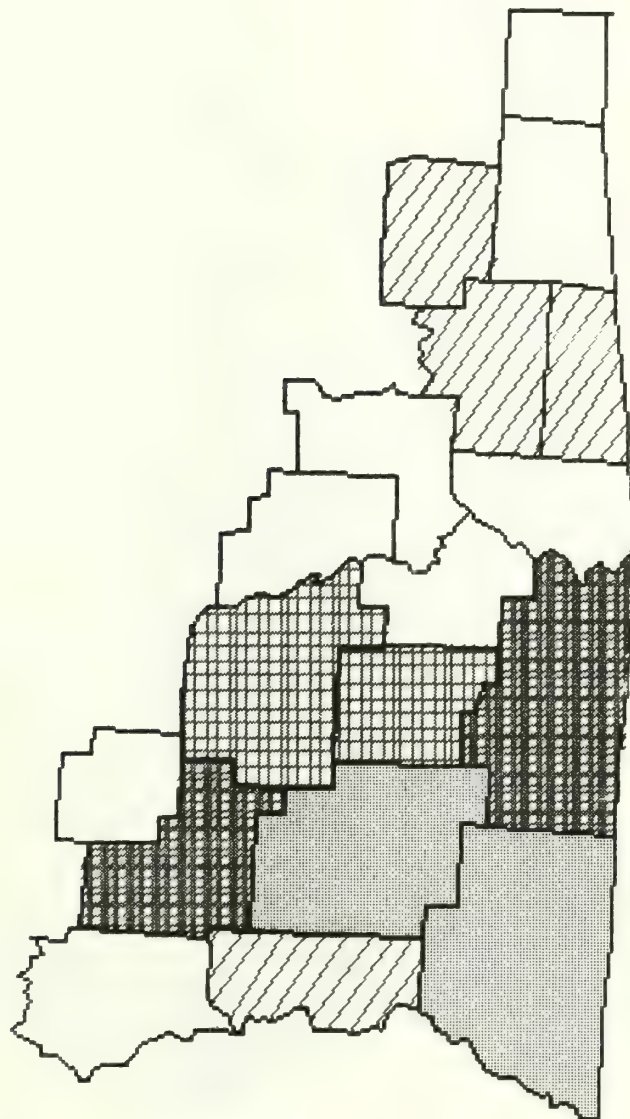
10 TO 20
60 TO 70

20 TO 40
> 70

40 TO 60

PERCENT TIMBERLAND BY COUNTY

LOBLOLLY/SHORTLEAF FOREST TYPE



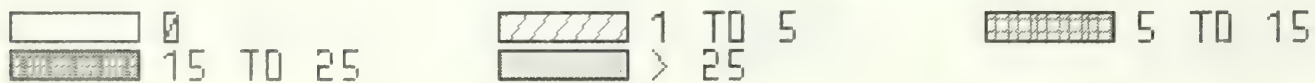
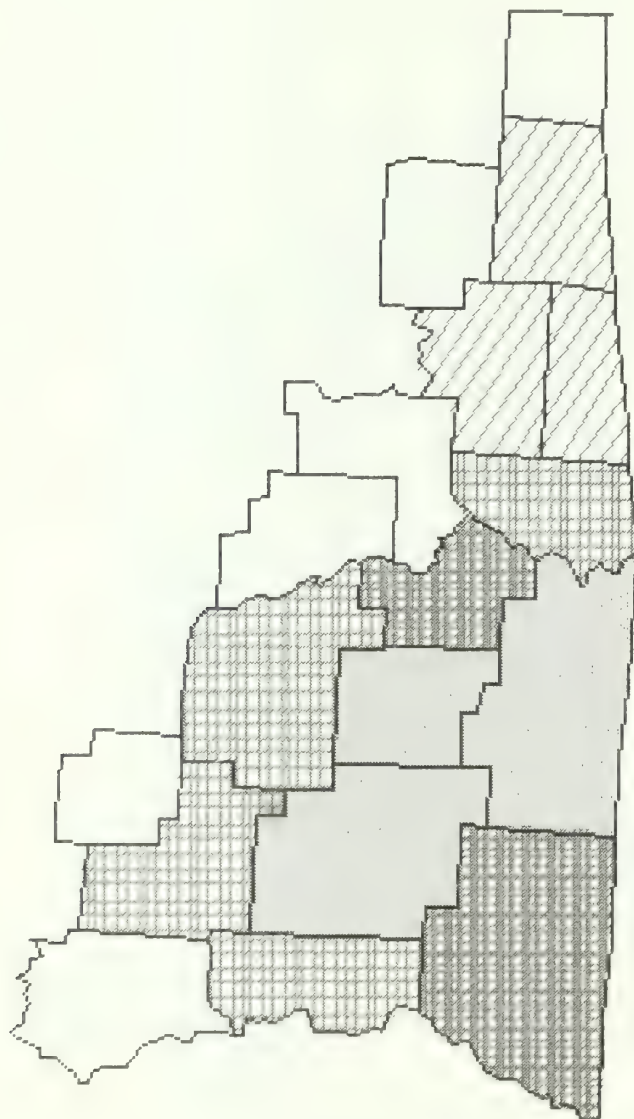
0
20 TO 35

1 TO 10
> 35

10 TO 20

PERCENT TIMBERLAND BY COUNTY

OAK/PINE FOREST TYPE

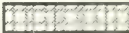


PERCENT TIMBERLAND BY COUNTY

OAK/HICKORY FOREST TYPE



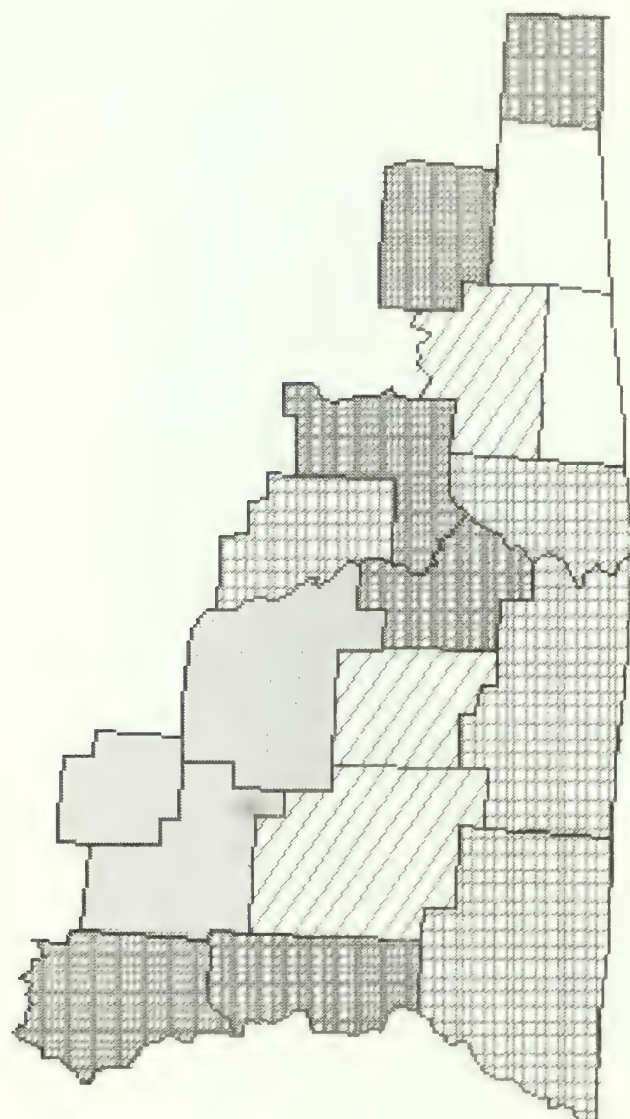
 < 50
 50 TO 60

 60 TO 80
 80 TO 90

 > 90

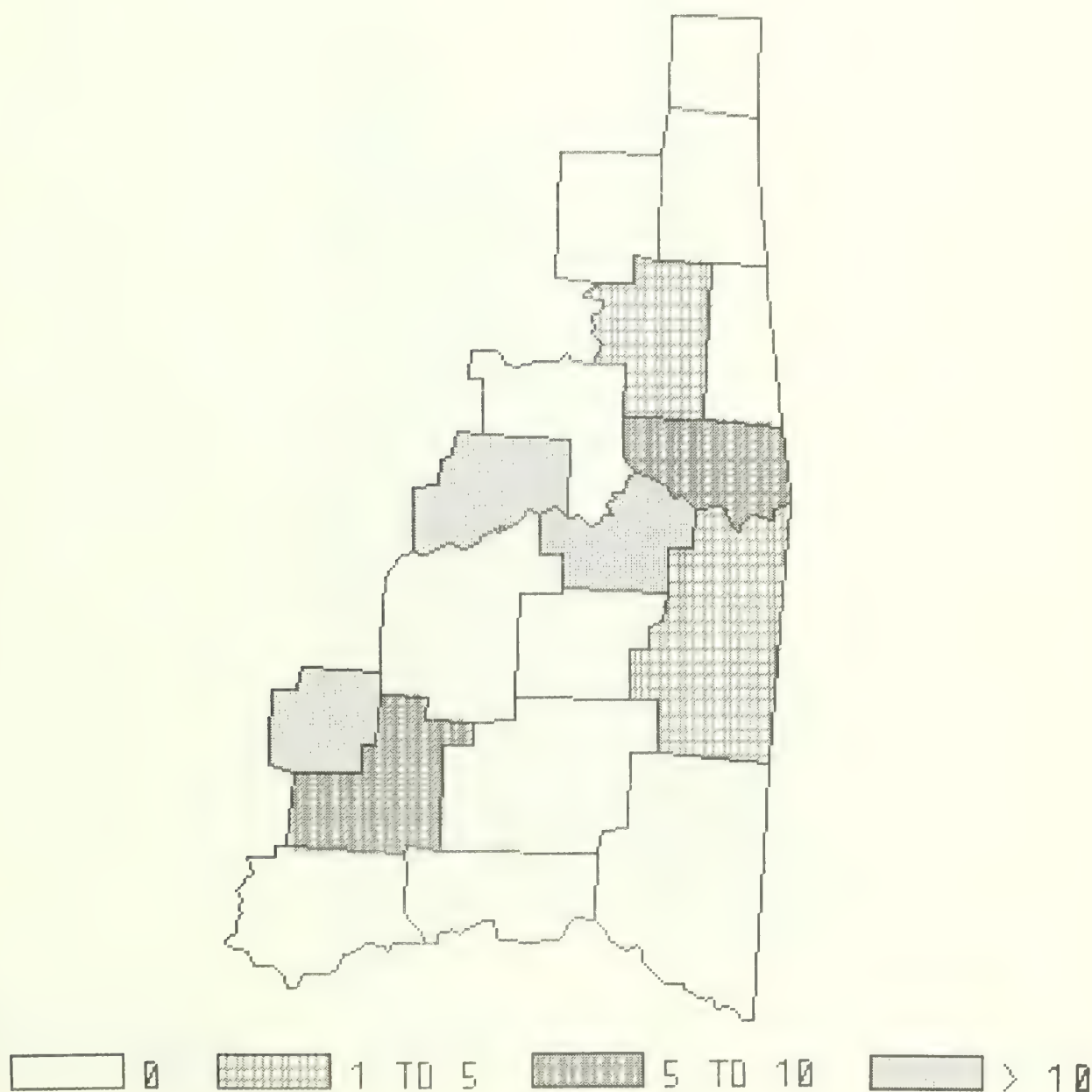
PERCENT TIMBERLAND BY COUNTY

OAK/GUM/CYPRESS FOREST TYPE



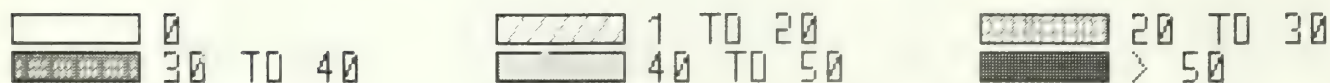
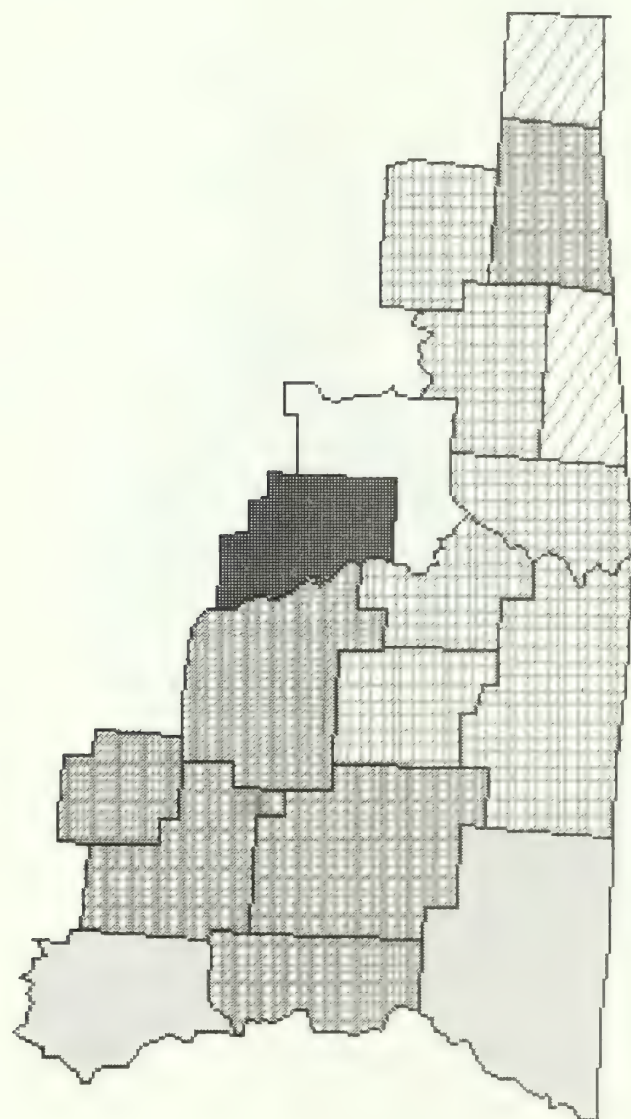
PERCENT TIMBERLAND BY COUNTY

ELM/ASH/COTTONWOOD FOREST TYPE



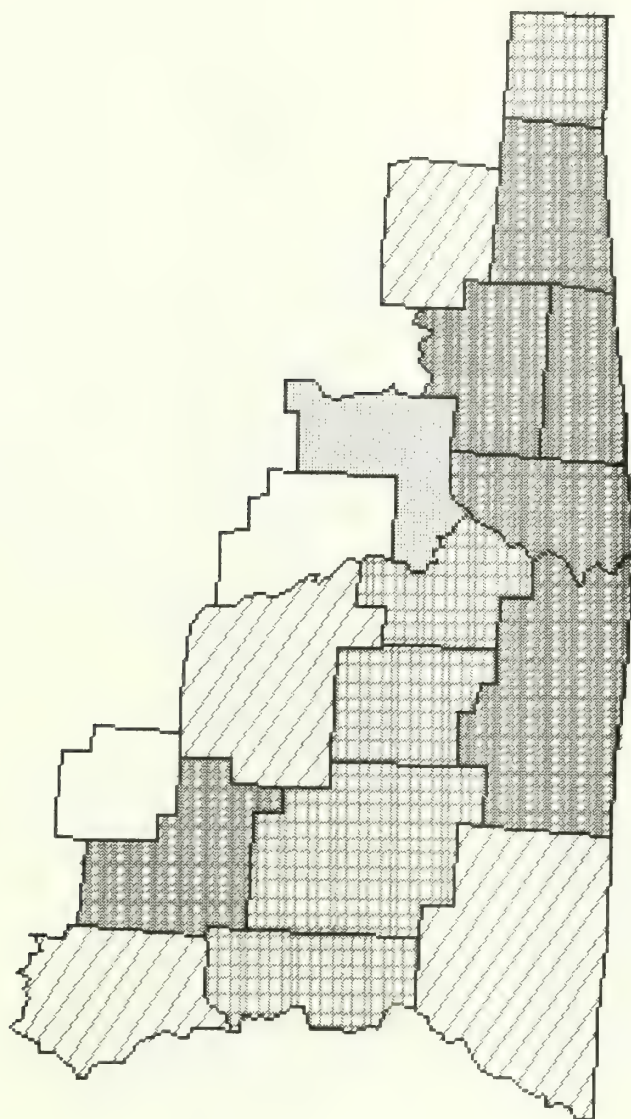
PERCENT TIMBERLAND BY STAND SIZE CLASS

SAPLINGS

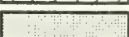


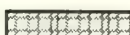
PERCENT TIMBERLAND BY STAND SIZE CLASS

POLETIMBER



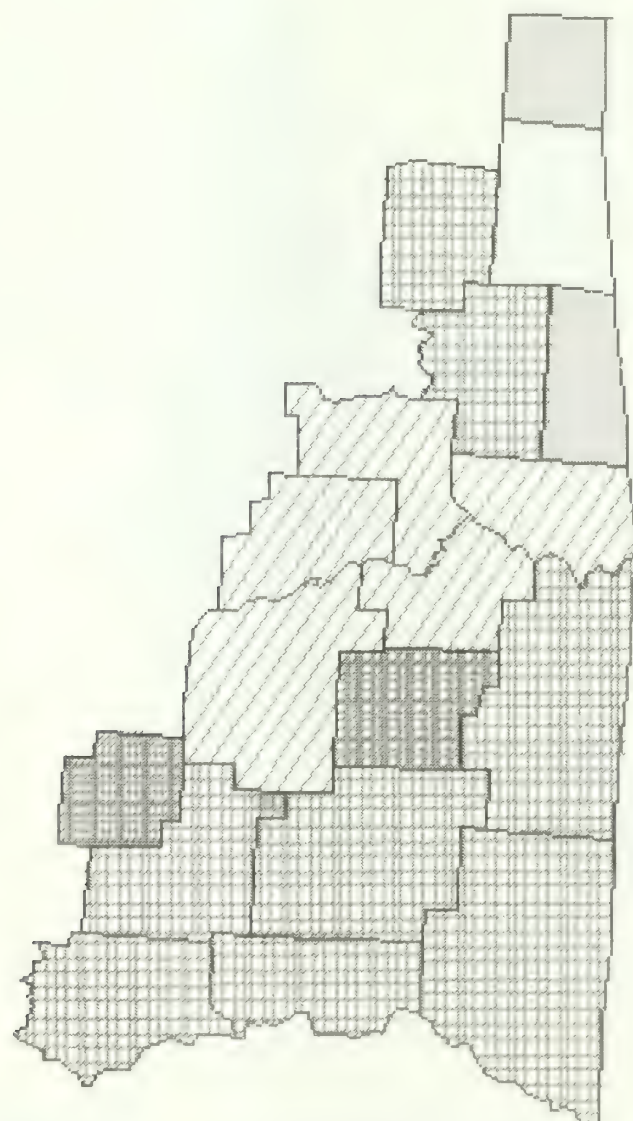
 < 10
 40 TO 50

 20 TO 30
 > 50

 30 TO 40

PERCENT TIMBERLAND BY STAND SIZE CLASS

SAWTIMBER



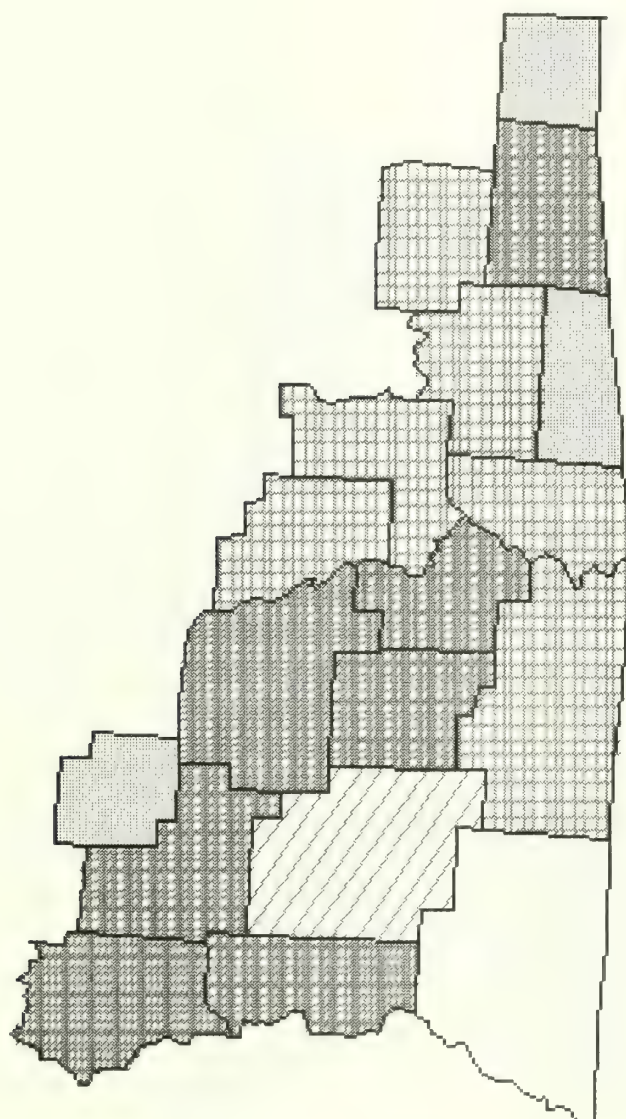
 < 10
 30 TO 40

 10 TO 20
 40 TO 50

 20 TO 30

PERCENT TIMBERLAND BY OWNERSHIP CLASS

PRIVATE NONINDUSTRIAL



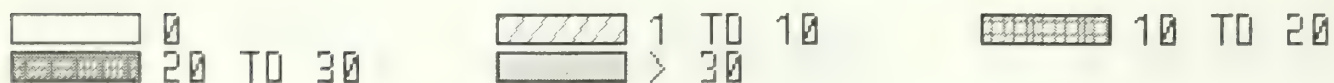
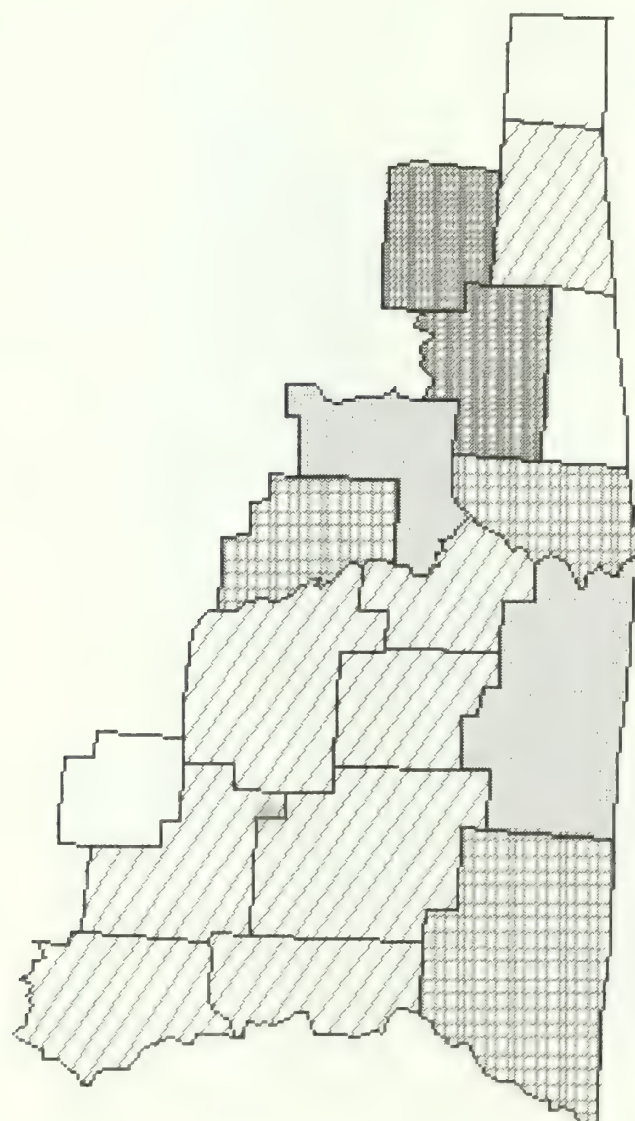
15 TO 25
90 TO 95

25 TO 50
> 95

50 TO 90

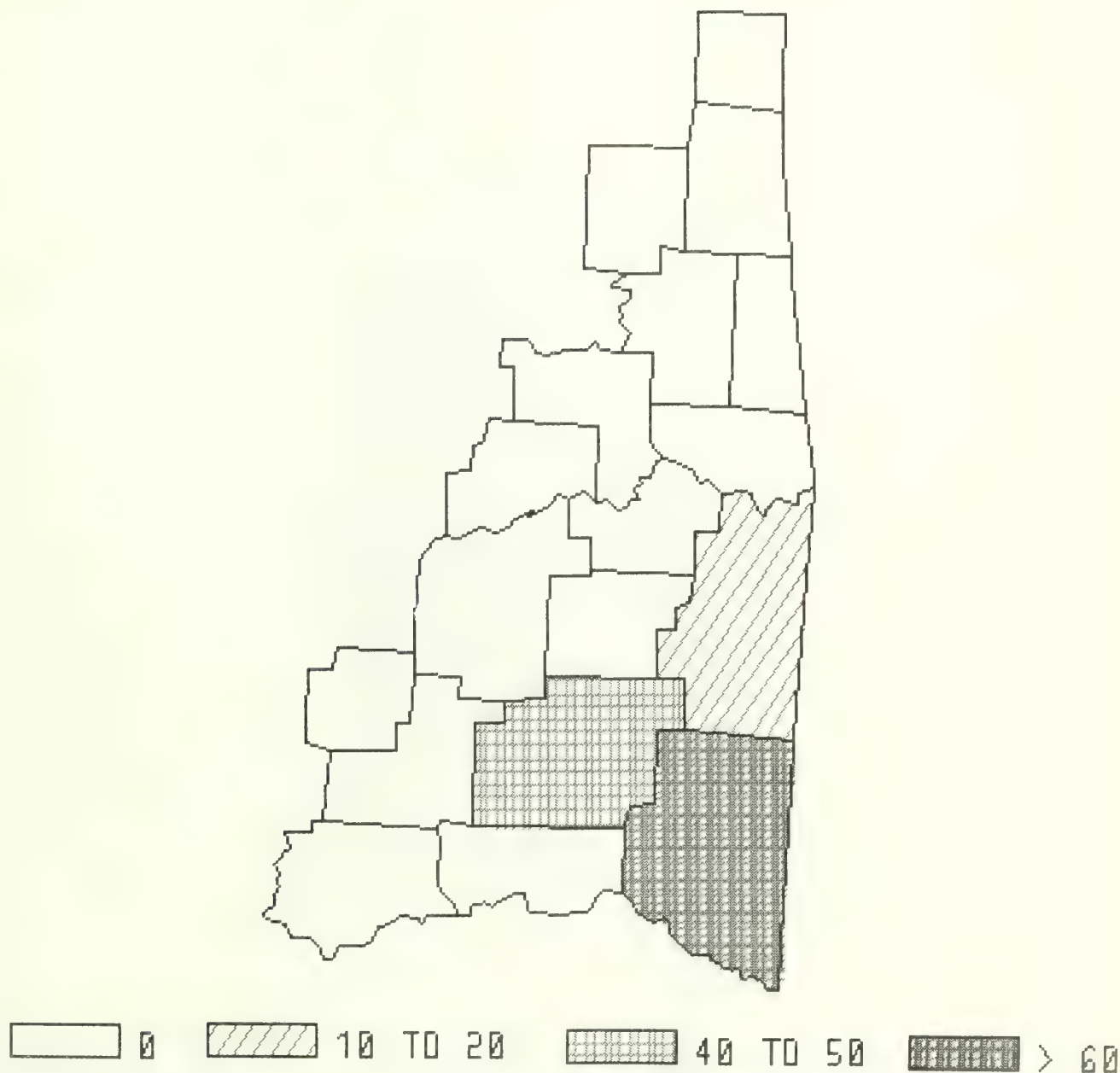
PERCENT TIMBERLAND BY OWNERSHIP CLASS

PUBLIC



PERCENT TIMBERLAND BY OWNERSHIP CLASS

FOREST INDUSTRY



SOFTWOOD GROWING STOCK VOLUME BY COUNTY

(MILLION CUBIC FEET)



0
50 TO 150

< 10
150 TO 300

10 TO 50
> 300

HARDWOOD GROWING STOCK VOLUME BY COUNTY

(MILLION CUBIC FEET)

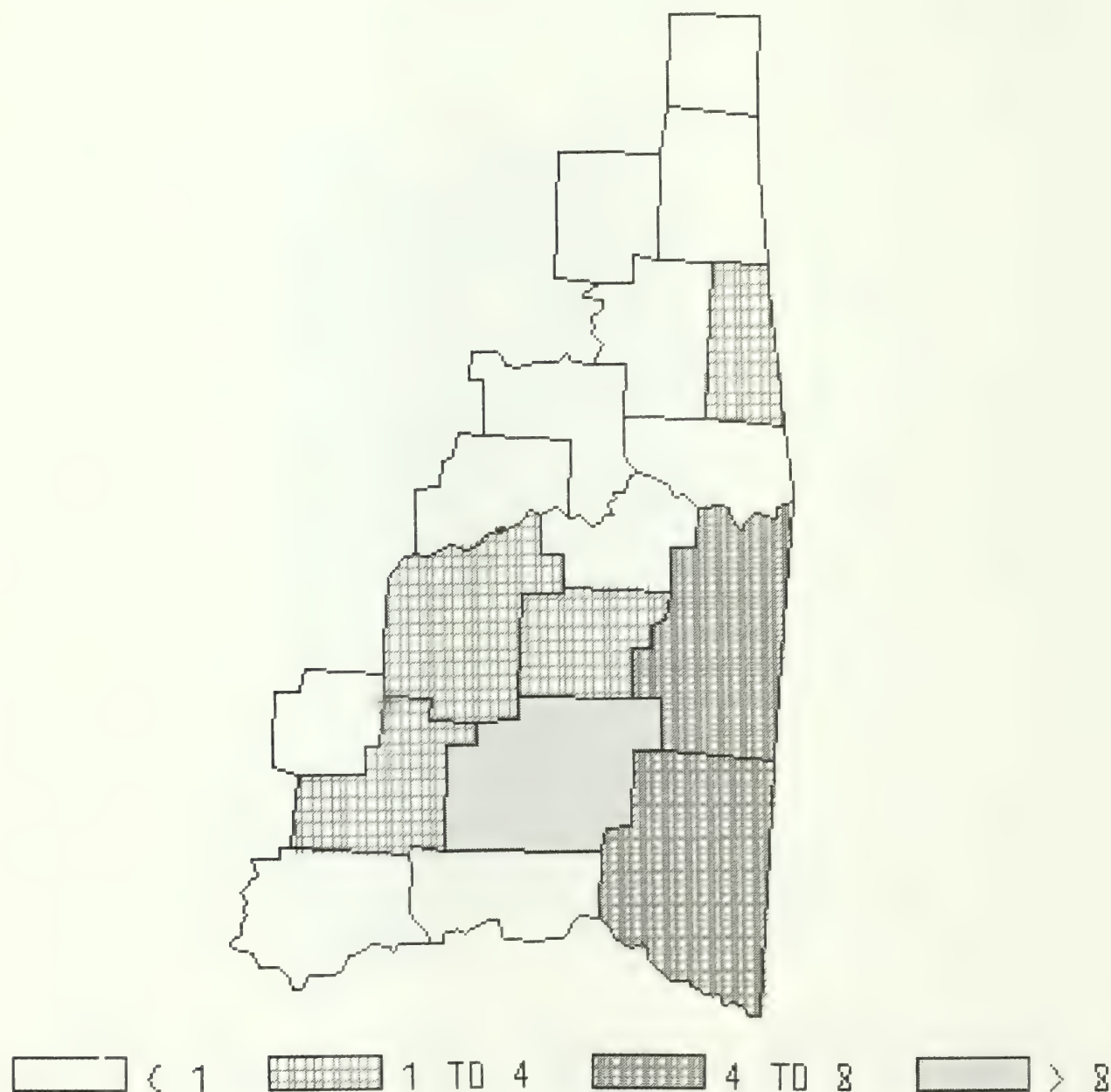


10 TO 30
100 TO 200

30 TO 50
> 200

50 TO 100

SOFTWOOD ROUGH & ROTTEN VOLUME BY COUNTY (MILLION CUBIC FEET)



HARDWOOD ROUGH & ROTTEN VOLUME BY COUNTY (MILLION CUBIC FEET)

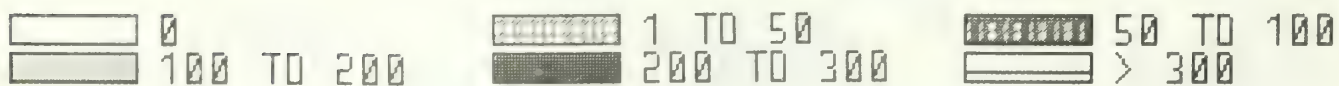


10 TO 30
50 TO 60

30 TO 40
> 60

40 TO 50

AVERAGE SOFTWOOD GROWING STOCK VOLUME (CUBIC FEET PER ACRE)



AVERAGE HARDWOOD GROWING STOCK VOLUME

(CUBIC FEET PER ACRE)

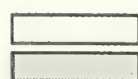


150 TO 250
450 TO 550

250 TO 350
> 550

350 TO 450

AVERAGE SOFTWOOD ROUGH & ROTTEN VOLUME (CUBIC FEET PER ACRE)



0
8 TO 12

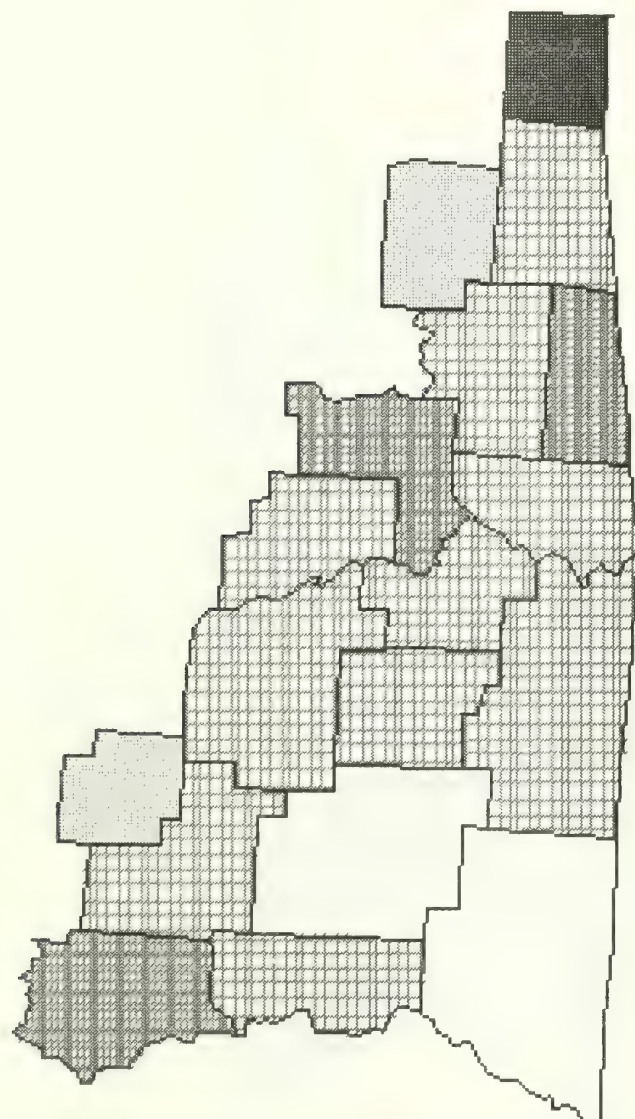


1 TO 4
> 12



4 TO 8

AVERAGE HARDWOOD ROUGH & ROTTEN VOLUME (CUBIC FEET PER ACRE)



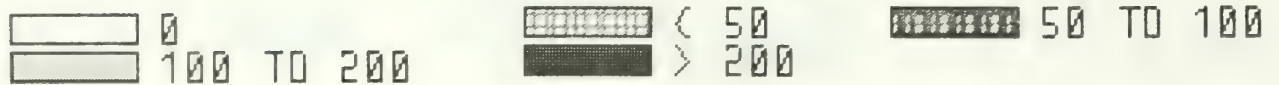
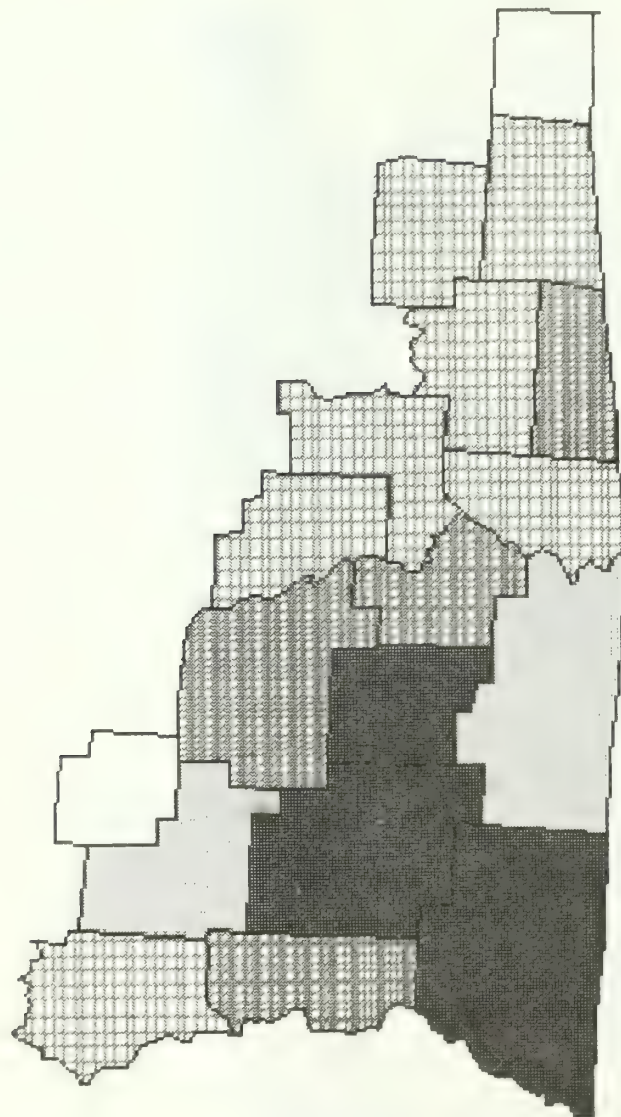
50 TO 150
300 TO 350

150 TO 250
> 350

250 TO 300

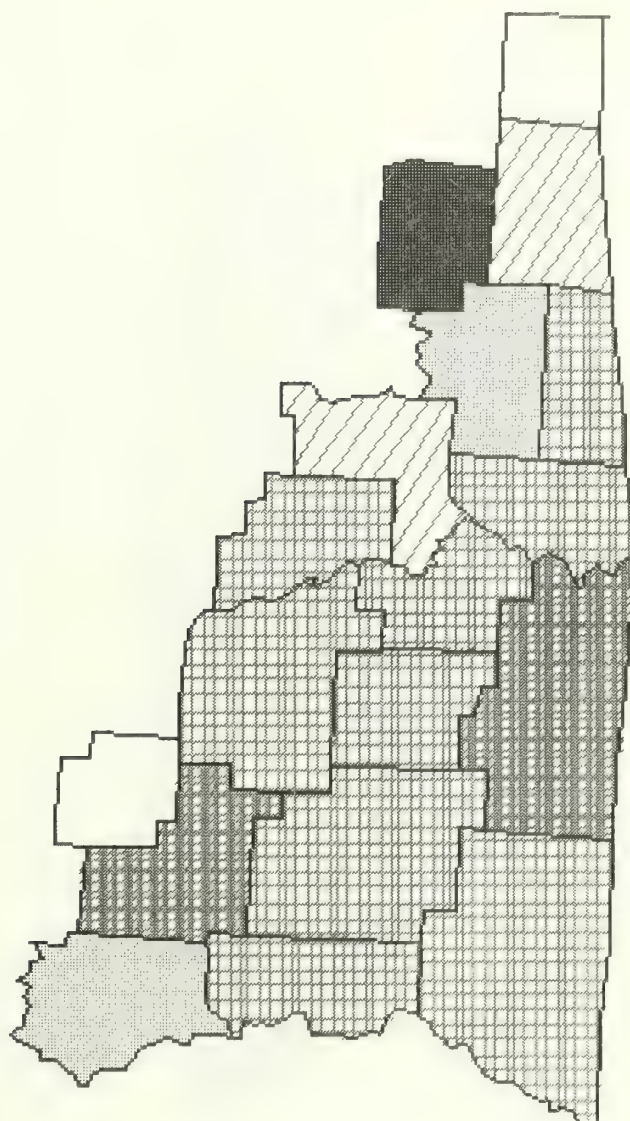
AVERAGE NUMBER LIVE TREES/ ACRE BY COUNTY

SOFTWOOD



AVERAGE SOFTWOOD DBH BY COUNTY

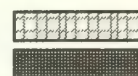
(QUADRATIC MEAN DIAMETER)
(INCHES)



0
5 TO 6

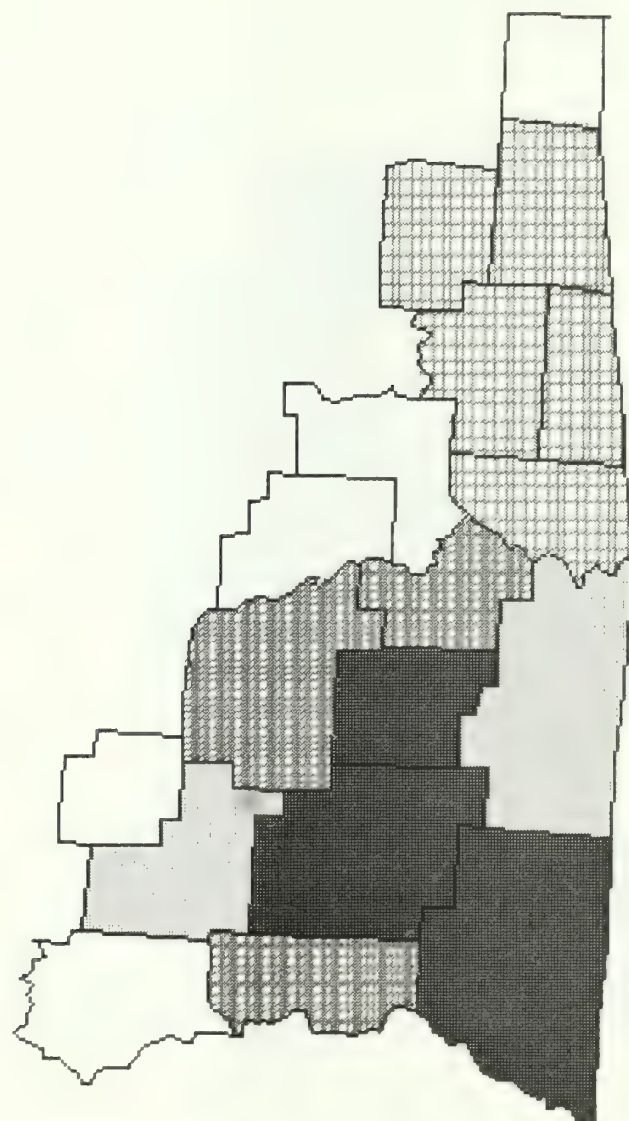


1 TO 4
6 TO 7



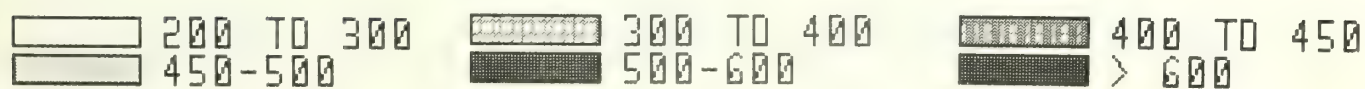
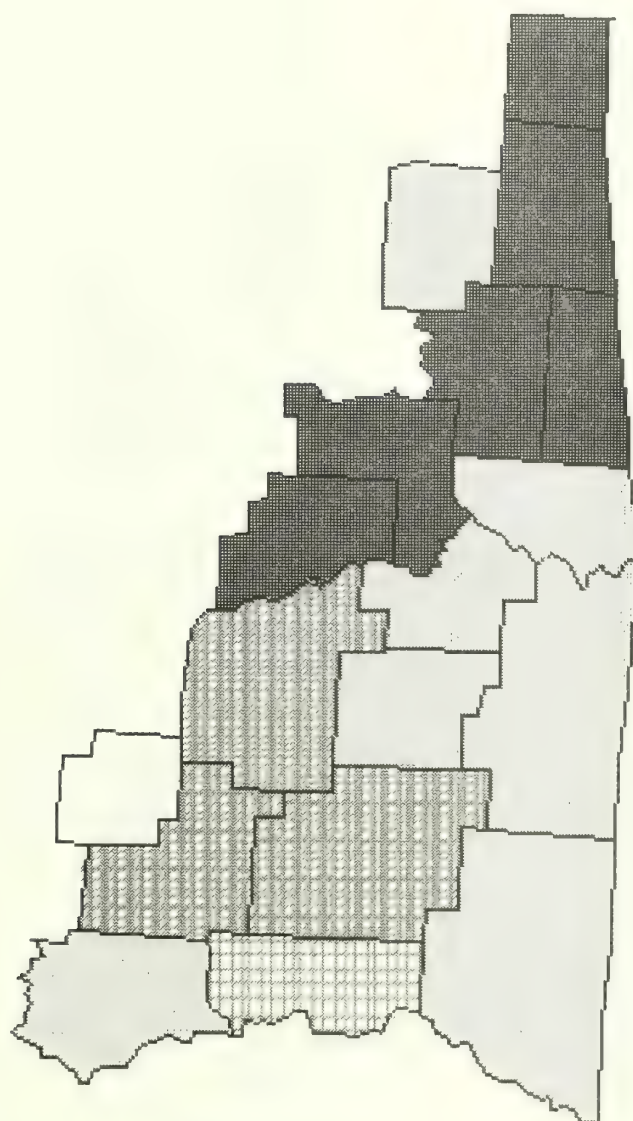
4 TO 5
> 7

AVERAGE SOFTWOOD BASAL AREA/ ACRE BY COUNTY (IN SQUARE FEET)



ACRE BY COUNTY

HARDWOOD

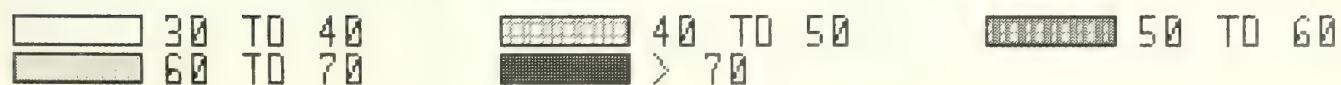
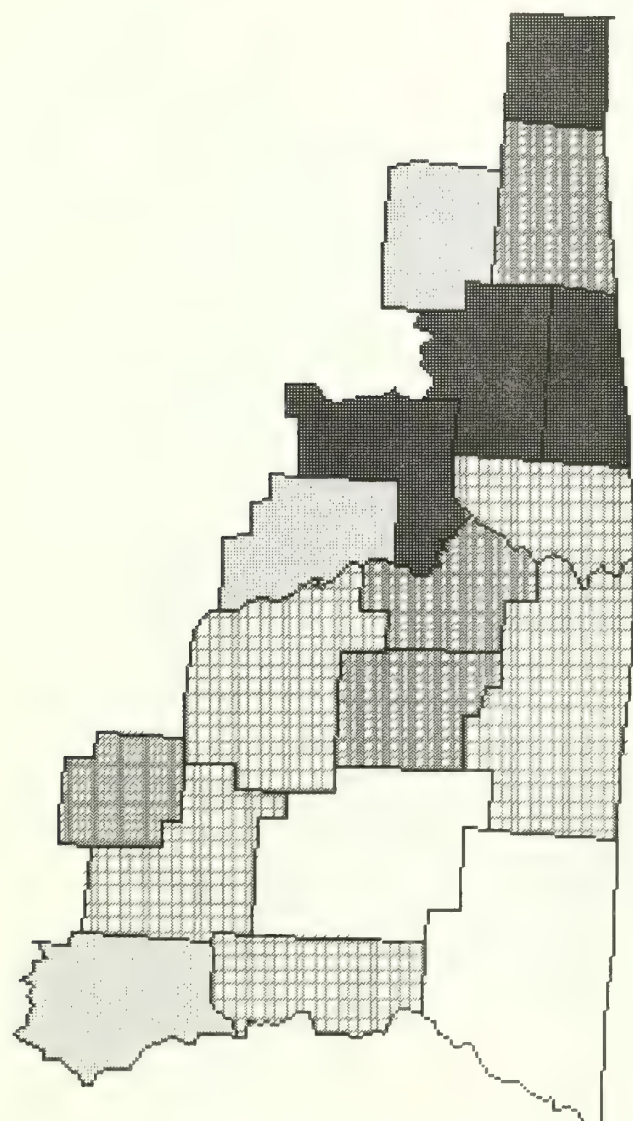


AVERAGE HARDWOOD DBH BY COUNTY

(QUADRATIC MEAN DIAMETER)
(INCHES)

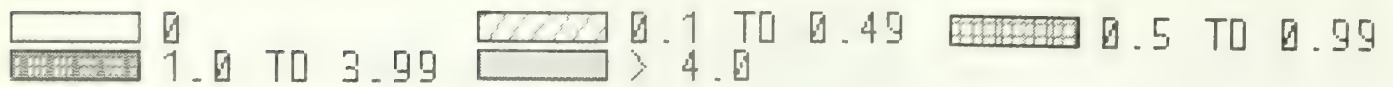
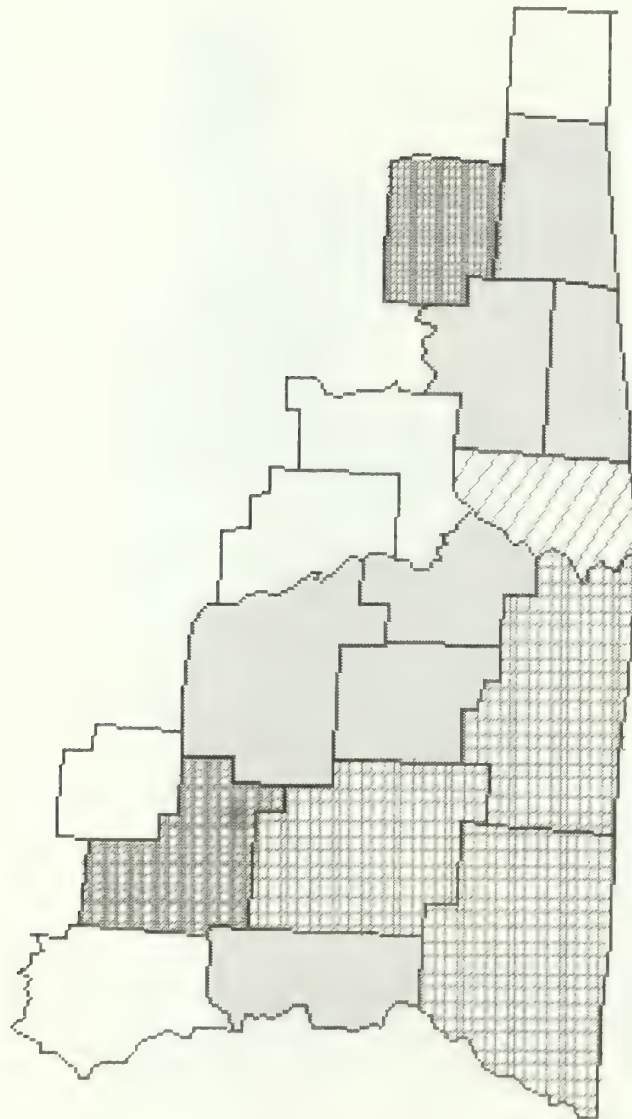


AVERAGE HARDWOOD BASAL AREA/
ACRE BY COUNTY
(IN SQUARE FEET)



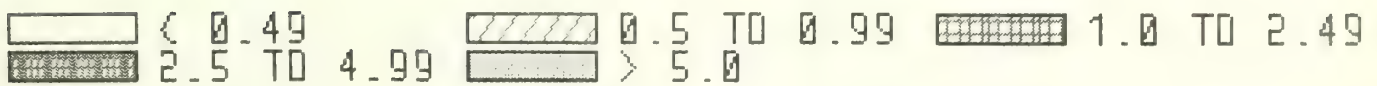
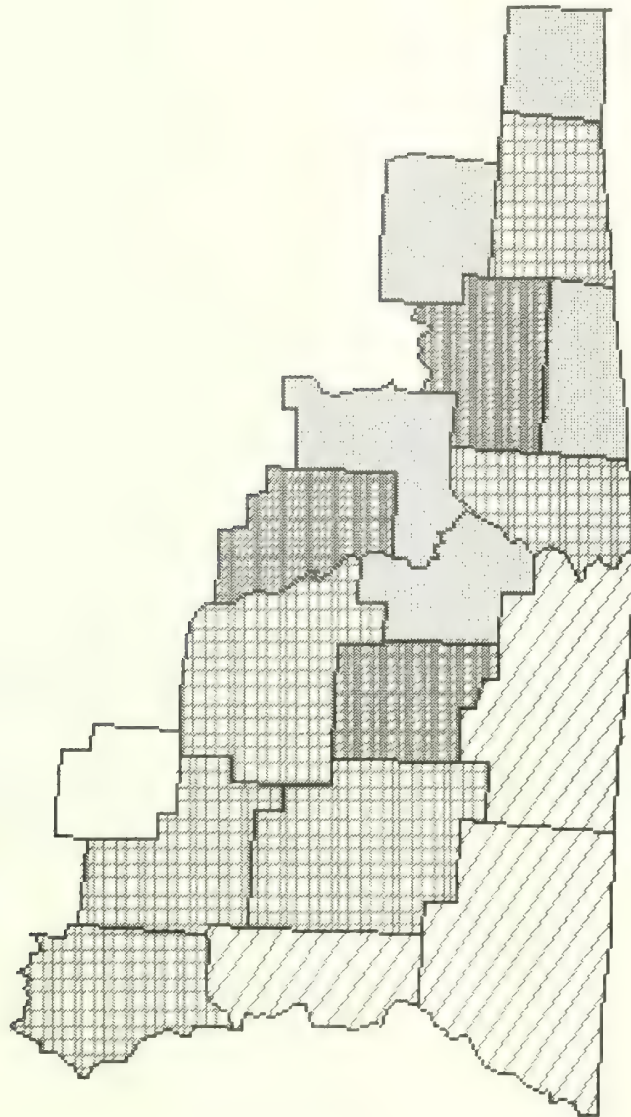
GROWTH/REMOVALS

SOFTWOOD



GROWTH/REMOVALS

HARDWOOD



U.S. GOVERNMENT PRINTING OFFICE:1987 -761 -086/ 60013

Hines, Franklin D. and Bertelson, Daniel F., Forest statistics for east Oklahoma counties - 1986. Resour. Bull. SO- 121. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 1987. 57p.

Tabulates forest resource information from a new inventory of East Oklahoma counties.

Additional Keywords: Area, volume, forest type, stand size, ownership.

A 13.80: So - Resource Bulletin no. 122
is available on microfiche which is located
in microfiche cabinets on third floor.

13,801 SO-123



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**Southern Forest
Experiment Station**

New Orleans,
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Resource Bulletin
SO-123



Midcycle Survey of Arkansas' Forest Resources

Roy C. Beltz, Randall Leister, and Walter R. Smith



April 1987

Midcycle Survey of Arkansas' Forest Resources

Roy C. Beltz, Randall Leister, and Walter R. Smith

INTRODUCTION

This report summarizes an interim survey of Arkansas' forest resources. Field work was completed in April 1985. The survey provides new estimates of forest area and inventory for both the State's softwoods and hardwoods. This survey was a cooperative effort with the Arkansas Forestry Commission, the Soil Conservation Service, the Statistical Reporting Service, and the Forest Service.

METHODS AND PROCEDURES

Midcycle survey estimates were derived by remeasuring 12 percent (330 plots) of the permanent plots measured by Forest Inventory and Analysis personnel during periodic forest surveys. Timberland was estimated by photo interpretation of National High Altitude Photography (NHAP) and by enumeration of classified Landsat scenes. All of the regular permanent plots that were still forested were updated by using relationships between plots measured in both the regular survey of 1978 and in the midcycle survey of 1985.

Area Estimation

A cooperative venture between the Statistical Reporting Service (SRS), the Soil Conservation Service (SCS) and the Forest Service was in progress at the time of the midcycle survey. Personnel from the three agencies developed a set of common definitions for various land cover classes in Arkansas. The SRS applied these criteria to sample land segments in their June enumerative study. Relationships between these ground samples and corresponding Landsat imagery were used then to estimate forest cover in Arkansas. This procedure had been used for some time by the SRS to improve the relative efficiency of their crop estimates. (Hanuschak and others 1982).

The standard forest survey process was the second method of estimating land covered by forests. Permanent sample points were transferred, using proportional dividers, from previous aerial photography to a 9- by 9-inch NHAP. The points were marked on the photos and interpreted as forest, nonforest, or water. An additional 25 photo-points, distributed on a fixed

grid about each permanent plot, were interpreted according to the same classes. The photo-point classification was used to develop area estimates for these interpreted classes.

No new information on ownership of forest land was collected.

Volume Estimation

Field procedures were essentially the same as those used in the 1978 survey. Volumes of individual trees were computed deterministically, using algorithms developed as part of STX (Grosenbaugh 1971). These volumes, summed for softwoods and for hardwoods, were compared to corresponding values for 1978. Estimates of per-acre volume for both the 1978 and 1984 surveys were established for all resurveyed plots.

Regression equations, for softwoods and hardwoods, were developed for each survey region (fig. 1). These regressions, reflecting volume changes on the remeasured plots, were applied to all of the plots from the previous survey in 1978.

Growth and Removals

Because of the small sampling, no attempt was made to produce county estimates of growth, or to account for any of the components of growth during the intersurvey period.

Removals estimates were derived from products output data from various sources. Severance tax information was used to update removals of saw log, veneer log, and miscellaneous product output. Pulpwood removals were estimated by using the annual pulpwood production data compiled by the Southern Forest Experiment Station's FIA unit. Removals estimates were compiled for each year and then averaged to obtain average annual removals. Fuelwood estimates for 1978 (Van Hees 1980) and 1984 (Benney 1984) were averaged to obtain an estimate of average annual removals for the period.

Limitations to using severance and pulpwood data for removals do exist. Accurate reporting, for both amount and county source, are essential to achieving sound estimates of removals by county. While errors are known to occur in this source, data were used in this study because they were judged to be more reli-



Figure 1.—Forest survey regions of Arkansas.

able than estimates developed from the limited number of remeasured plots. A further limitation using the Arkansas severance tax information for tracking trends in output of various forest products is a change in reporting that occurred in 1983. All products are now reported in green tons. While the change may produce gains in efficiency and perhaps even revenues, it does limit the utility of severance tax as an indicator of output of various forest products. Because of the reporting changes, removals estimates based on severance tax were held constant from 1982–1984.

RESULTS

Slightly more than half of the State of Arkansas' acreage supports forest cover. The SRS estimate of 17.635 million acres in forest cover was nearly identical to the FIA estimate of 17.643 million acres. There is no difference statistically. The FIA estimate is used in the balance of this report to avoid making minor adjustments in the table cells. Moreover, the focus of the midcycle survey is on the commercial forest resource, a subset of the forest cover of Arkansas.

Of special note is a slight increase in the total area of Arkansas. The 1980 census reports Arkansas has a total of 34.04 million acres, up some 50,000 acres over 1970. New census figures are the basis from which estimates of forest land for each county are derived.

Total commercial forest area (timberland) in Arkansas is 16.424 million acres, nearly 200,000 acres less than the 1978 survey total. Most of the decline was in the heavily timbered Southwest, and the rest occurred in the Ouachita Region. Loblolly-shortleaf pine type declined 123,000 acres; oak-pine declined 76,000 acres. Other forest types remained fairly constant since the 1978 survey.

Softwood growing-stock volume dropped nearly 5 percent since the last survey. Most of the loss was in the Southwest. Gains in other regions failed to offset the loss statewide. Softwood volume is concentrated in pine forest type (64 percent), but about 22 percent is in oak-pine types.

Hardwood growing stock gained almost 4 percent since the last survey with changes mixed among the geographic units. Again, the Southwest registered the largest loss, offset by gains in the other units. Oak-hickory types comprised the largest share of the hardwood volume (47 percent), followed by oak-gum-cypress (30 percent) and oak-pine types (13 percent). Pine types contain about 8 percent of the hardwood volume.

The 1985 interim survey confirms past trends in Arkansas' forest resources; i.e., area continues to decline slightly and volume per acre continues to increase. Net growth, as a percent of inventory, has been declining steadily as Arkansas' forests mature. Based on estimated annual removals and the net change between surveys, we expect this downward trend to have continued through this interim survey. Softwood volume per acre has apparently dropped below 1978 levels and removals probably exceed growth. The hardwood inventory continues to rise slightly but will probably level off or decline slightly. The next full survey of Arkansas, scheduled to begin in 1987, will provide more definitive results.

Estimates developed from the limited sampling of the midcycle survey should be used cautiously. With 330 plots distributed among 75 counties, the number of plots per county would average only 4 to 5. Because selection probability was proportional to volume measured during the 1978 survey, more plots were remeasured in the more heavily forested Southwest and Quachita regions of the State than elsewhere. Accordingly, estimates for these regions are more reliable than those for the less heavily forested regions. In all regions, county estimates should be grouped for meaningful analysis.

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Tables are numbered to correspond to those in the 1978 survey report (Staff 1979). No rounding of totals was applied, and individual table cells may not sum to the total.

Table 1.—*Sampling errors for forest land and volume estimates, 1984*

Item	Sampling error
	<i>Percent</i>
Timberland	0.2
Growing-stock volume	1.39
Sawtimber volume	1.73

Table 2.—*Timberland, growing-stock, and sawtimber volume, 1985, and change since 1978*

Unit	Timberland	Change	Growing stock				Sawtimber			
			Softwood		Hardwood		Softwood		Hardwood	
			Volume	Change	Volume	Change	Volume	Change	Volume	Change
	<i>Thousand acres</i>	<i>Percent</i>	<i>Million cubic ft</i>	<i>Percent</i>	<i>Million cubic ft</i>	<i>Percent</i>	<i>Million board ft</i>	<i>Percent</i>	<i>Million board ft</i>	<i>Percent</i>
Delta	1924.9	+5	276.9	+16	1,707.8	-4	1,016.7	-4	6,397.7	-1
Southwestern	6159.7	-4	4,205.8	-14	3,252.4	-1	21,613.0	-1	10,278.8	+6
Ouachita	3072.8	-4	2,494.5	+8	1,230.2	+19	10,646.1	+19	2,535.6	+18
Ozark	5266.9	+1	792.6	+13	3,265.3	+43	3,319.7	+43	8,925.7	+30
All units	16424.3	-1	7,769.8	-5	9,455.7	+7	36,595.5	+7	28,137.8	+12

Table 3.—Total area, timberland 1978 and 1985, and proportion of total area in 1985

County	Total area	Timberland		Proportion
		Area '78	Area '85	
----- Thousand acres -----				
Arkansas	661.36	207.90	193.08	29.19
Ashley	601.32	369.20	378.57	62.96
Baxter	375.47	165.20	179.73	47.87
Benton	562.35	176.00	200.54	35.66
Boone	385.07	134.40	117.87	30.61
Bradley	419.10	366.00	345.44	82.43
Calhoun	404.41	336.30	309.11	76.44
Carroll	410.60	136.30	186.09	45.32
Chicot	442.12	67.20	89.14	20.16
Clark	565.19	400.20	373.36	66.06
Clay	410.31	68.40	58.22	14.19
Cleburne	378.82	214.20	235.03	62.04
Cleveland	383.21	319.00	338.31	88.28
Columbia	490.94	390.00	354.66	72.24
Conway	362.60	120.00	107.44	29.63
Craighead	456.80	47.30	57.41	12.57
Crawford	387.21	213.90	193.56	49.99
Crittenden	407.62	35.50	21.45	5.26
Cross	398.84	40.00	54.82	13.74
Dallas	427.35	360.40	339.05	79.34
Desha	522.03	154.00	165.88	31.78
Drew	534.85	364.00	338.03	63.20
Faulkner	425.17	144.00	126.27	29.70
Franklin	396.37	204.00	219.69	55.43
Fulton	395.96	171.60	186.45	47.09
Garland	470.02	313.20	302.99	64.46
Grant	405.40	333.20	335.92	82.86
Greene	370.83	50.40	60.92	16.43
Hempstead	474.08	268.80	266.93	56.30
Hot Spring	398.07	259.60	261.58	65.71
Howard	380.98	235.20	239.71	62.92
Independence	493.77	223.20	214.06	43.35
Izard	374.27	159.50	197.08	52.66
Jackson	410.33	53.20	47.09	11.48
Jefferson	586.42	214.20	218.86	37.32
Johnson	437.10	275.60	250.59	57.33
Lafayette	349.43	198.40	195.10	55.83
Lawrence	378.37	84.00	109.20	28.86
Lee	399.26	88.50	119.51	29.93
Lincoln	364.77	133.40	152.93	41.92
Little River	360.46	188.80	148.90	41.31
Logan	468.27	212.40	212.18	45.31
Lonoke	514.22	78.00	59.50	11.57
Madison	535.98	336.00	327.12	61.03
Marion	409.81	123.90	108.32	26.43
Miller	408.47	168.00	137.23	33.60
Mississippi	591.92	20.80	19.02	3.21
Monroe	397.45	145.60	143.00	35.98
Montgomery	512.36	410.40	417.96	81.58
Nevada	397.22	306.80	330.15	83.12
Newton	526.71	380.80	373.46	70.90
Ouachita	473.56	384.40	357.55	75.50
Perry	358.84	277.30	250.93	69.93
Phillips	465.56	87.60	80.62	17.32
Pike	392.76	296.40	297.08	75.64
Poinsett	489.47	41.80	52.27	10.68
Polk	551.69	418.90	376.30	68.21
Pope	531.31	365.80	337.47	63.52
Prairie	432.54	76.50	78.36	18.12
Pulaski	516.56	221.40	198.60	38.45
Randolph	419.96	147.00	158.02	37.63

Table 3.—*Total area, timberland 1978 and 1985, and proportion of total area in 1985—*
Continued

County	Total area	Timberland		
		Area '78	Area '85	Proportion
		----- Thousand acres -----		
St. Francis	410.98	62.70	74.10	18.03
Saline	467.45	355.10	352.82	75.48
Scott	575.03	477.90	460.16	80.02
Searcy	427.53	220.00	238.96	55.89
Sebastian	348.81	120.00	111.08	31.85
Sevier	372.27	249.60	223.06	59.92
Sharp	388.43	222.00	214.78	55.30
Stone	390.16	302.40	296.97	76.11
Union	675.69	594.00	590.00	87.32
Van Buren	463.44	313.20	337.04	72.72
Washington	611.92	255.00	238.00	38.89
White	666.78	200.60	222.36	33.35
Woodruff	380.10	68.60	69.48	18.28
Yell	607.74	390.50	389.79	64.14
All counties	34039.64	16615.60	16424.31	48.25

Table 5.—*Timberland by forest type, 1985*

County	All types	Loblolly- shortleaf	Oak-pine	Oak-hickory	Oak-gum- cypress	Elm-ash- cottonwood
----- Thousand acres -----						
Arkansas	193.08	.....	.....	46.81	128.72	17.55
Ashley	378.57	218.61	63.98	42.66	53.32	.....
Baxter	179.73	6.42	19.26	154.06	.....	.....
Benton	200.54	.....	6.27	194.28	.....	.....
Boone	117.87	.....	11.23	106.65	.....	.....
Bradley	345.44	164.23	39.64	67.96	73.62	.....
Calhoun	309.11	130.15	59.65	32.54	86.77	.....
Carroll	186.09	.....	44.92	141.17	.....	.....
Chicot	89.14	.....	.....	5.57	61.28	22.28
Clark	373.36	167.74	91.99	48.70	64.93	.....
Clay	58.22	.....	.....	12.94	45.28	.....
Cleburne	235.03	39.17	50.36	139.90	5.60	.....
Cleveland	338.31	135.32	61.51	61.51	79.96	.....
Columbia	354.66	165.51	59.11	53.20	76.84	.....
Conway	107.44	20.14	20.14	47.00	20.14	.....
Craighead	57.41	.....	.....	20.88	31.31	5.22
Crawford	193.56	12.49	43.71	137.37	.....	.....
Crittenden	21.45	.....	.....	.....	8.58	12.87
Cross	54.82	.....	.....	21.93	21.93	10.96
Dallas	339.05	134.62	79.78	59.83	64.82	.....
Desha	165.88	.....	.....	.....	128.18	37.70
Drew	338.03	120.73	86.92	62.78	67.61	.....
Faulkner	126.27	4.21	12.63	88.39	21.04	.....
Franklin	219.69	21.97	21.97	175.75	.....	.....
Fulton	186.45	11.30	5.65	169.50	.....	.....
Garland	302.99	109.70	99.26	94.03	.....	.....
Grant	335.92	98.80	79.04	69.16	88.92	.....
Greene	60.92	.....	5.08	40.62	10.15	5.08
Hempstead	266.93	105.66	44.49	72.29	44.49	.....
Hot Spring	261.58	47.56	77.29	112.96	23.78	.....
Howard	239.71	117.41	68.49	39.14	14.68	.....
Independence	214.06	23.78	35.68	154.60	.....	.....
Izard	197.08	40.78	20.39	129.12	6.80	.....

Table 5.—*Timberland by forest type, 1985—Continued*

County	All types	Loblolly- shortleaf	Oak-pine	Oak-hickory	Oak-gum- cypress	Elm-ash- cottonwood
<i>Thousand acres</i>						
Jackson	47.09	.....	.....	26.91	20.18	.....
Jefferson	218.86	52.11	31.27	46.90	78.17	10.42
Johnson	250.59	43.37	48.19	159.03	.....	.....
Lafayette	195.10	103.65	42.68	24.39	24.39	.....
Lawrence	109.20	.....	7.80	54.60	46.80	.....
Lee	119.51	.....	.....	15.93	95.60	7.97
Lincoln	152.93	19.95	6.65	79.79	39.89	6.65
Little River	148.90	55.84	37.22	27.92	23.27	4.65
Logan	212.18	64.83	58.94	76.62	11.79	.....
Lonoke	59.50	.....	.....	19.83	39.66	.....
Madison	327.12	16.36	16.36	294.41	.....	.....
Marion	108.32	10.32	.....	98.00	.....	.....
Miller	137.23	39.21	29.41	19.60	39.21	9.80
Mississippi	19.02	.....	.....	.....	9.51	9.51
Monroe	143.00	.....	10.21	10.21	122.57	.....
Montgomery	417.96	185.76	116.10	116.10	.....	.....
Nevada	330.15	133.33	63.49	76.19	57.14	.....
Newton	373.46	16.48	38.44	313.04	.....	5.49
Ouachita	357.55	109.57	80.74	74.97	92.27	.....
Perry	250.93	117.46	85.42	37.37	10.68	.....
Phillips	80.62	.....	.....	13.44	60.46	6.72
Pike	297.08	142.82	91.41	62.84	.....	.....
Poinsett	52.27	.....	.....	19.01	23.76	9.50
Polk	376.30	116.60	137.80	121.90	.....	.....
Pope	337.47	65.32	54.43	212.28	5.44	.....
Prairie	78.36	.....	.....	20.90	57.46	.....
Pulaski	198.60	33.91	43.60	77.50	38.75	4.84
Randolph	158.02	.....	7.53	135.45	15.05	.....
St. Francis	74.10	.....	.....	13.47	60.62	.....
Saline	352.82	110.59	94.79	105.32	42.13	.....
Scott	460.16	249.96	90.90	113.62	5.68	.....
Searcy	238.96	5.97	11.95	221.04	.....	.....
Sebastian	111.08	.....	16.66	77.76	11.11	5.55
Sevier	223.06	69.71	46.47	51.12	46.47	9.29
Sharp	214.78	11.61	17.41	185.76	.....	.....
Stone	296.97	26.52	79.55	190.91	.....	.....
Union	590.00	234.91	163.89	65.56	125.65	.....
Van Buren	337.04	40.68	46.49	249.87	.....	.....
Washington	238.00	9.52	4.76	223.72	.....	.....
White	222.36	6.54	19.62	130.80	65.40	.....
Woodruff	69.48	.....	.....	.....	69.48	.....
Yell	389.79	164.70	82.35	82.35	54.90	5.49
All counties	16424.31	4153.87	2890.92	6549.69	2622.25	207.56

Table 8.—*Timberland by physiographic site class, 1985*

County	All sites	Physiographic Class		
		Pine	Upland hardwood	Bottomland hardwood
----- Thousand acres -----				
Arkansas	193.08	.....	46.81	146.28
Ashley	378.57	319.92	.....	58.65
Baxter	179.73	83.45	96.29	.....
Benton	200.54	25.07	175.48	.....
Boone	117.87	28.06	89.81	.....
Bradley	345.44	271.82	.....	73.62
Calhoun	309.11	216.92	.....	92.19
Carroll	186.09	70.59	115.51	.....
Chicot	89.14	.....	5.57	83.56
Clark	373.36	308.43	.....	64.93
Clay	58.22	.....	12.94	45.28
Cleburne	235.03	229.44	.....	5.60
Cleveland	338.31	258.34	.....	79.96
Columbia	354.66	277.82	.....	76.84
Conway	107.44	67.15	20.14	20.14
Craighead	57.41	.....	20.88	36.53
Crawford	193.56	56.20	137.37	.....
Crittenden	21.45	.....	.....	21.45
Cross	54.82	10.96	10.96	32.89
Dallas	339.05	269.24	.....	69.80
Desha	165.88	.....	.....	165.88
Drew	338.03	255.94	4.83	77.26
Faulkner	126.27	33.67	71.55	21.04
Franklin	219.69	117.17	102.52	.....
Fulton	186.45	45.20	141.25	.....
Garland	302.99	302.99	.....	.....
Grant	335.92	247.00	.....	88.92
Greene	60.92	25.38	20.31	15.23
Hempstead	266.93	216.88	5.56	44.49
Hot Spring	261.58	237.80	.....	23.78
Howard	239.71	225.03	.....	14.63
Independence	214.06	107.03	107.03	.....
Izard	197.08	149.51	40.78	6.80
Jackson	47.09	.....	26.91	20.18
Jefferson	218.86	130.28	.....	88.59
Johnson	250.59	149.39	101.20	.....
Lafayette	195.10	164.62	.....	30.48
Lawrence	109.20	.....	62.40	46.80
Lee	119.51	.....	15.93	103.57
Lincoln	152.93	106.38	.....	46.54
Little River	148.90	120.98	.....	27.92
Logan	212.18	194.50	5.89	11.79
Lonoke	59.50	.....	19.83	39.66
Madison	327.12	32.71	294.41	.....
Marion	108.32	67.05	41.26	.....
Miller	137.23	73.51	.....	63.71
Mississippi	19.02	.....	.....	19.02
Monroe	143.00	15.32	5.11	122.57
Montgomery	417.96	417.96	.....	.....
Nevada	330.15	241.26	.....	88.89
Newton	373.46	148.28	225.17	.....
Ouachita	357.55	247.98	.....	109.57
Perry	250.93	240.25	.....	10.68
Phillips	80.62	.....	13.44	67.18
Pike	297.08	297.08	.....	.....
Poinsett	52.27	.....	19.01	33.26
Polk	376.30	376.30	.....	.....
Pope	337.47	277.59	54.43	5.44
Prairie	78.36	10.45	10.45	57.46
Pulaski	198.60	145.32	4.84	48.44
Randolph	158.02	.....	142.98	15.05

Table 8.—*Timberland by physiographic site class, 1985—Continued*

County	All sites	Physiographic Class		
		Pine	Upland hardwood	Bottomland hardwood
----- <i>Thousand acres</i> -----				
St. Francis	74.10	.....	13.47	60.62
Saline	352.82	310.69	.....	42.13
Scott	460.16	448.80	5.68	5.68
Searcy	238.96	95.58	143.38	.....
Sebastian	111.08	55.54	38.88	16.66
Sevier	223.06	167.29	.....	55.76
Sharp	214.78	34.83	179.95	.....
Stone	296.97	206.82	90.15	.....
Union	590.00	447.97	.....	142.04
Van Buren	337.04	313.79	23.24	.....
Washington	238.00	19.04	218.96	.....
White	222.36	78.48	78.48	65.40
Woodruff	69.48	.....	.....	69.48
Yell	389.79	329.40	.....	60.39
All counties	16424.31	10422.47	3061.03	2940.80

Table 10.—*Growing-stock volume on timberland by species group, 1985*

County	All species	Softwood	Hardwood
----- Million cubic feet -----			
Arkansas	223.75	25.08	198.67
Ashley	324.85	217.88	106.97
Baxter	131.01	23.93	107.08
Benton	137.72	3.13	134.59
Boone	76.65	2.22	74.44
Bradley	409.43	239.45	169.97
Calhoun	292.30	198.14	94.16
Carroll	116.99	16.75	100.24
Chicot	88.38	0.00	88.38
Clark	500.00	268.51	231.49
Clay	63.23	0.00	63.23
Cleburne	181.53	80.28	101.25
Cleveland	533.13	269.23	263.90
Columbia	429.93	260.09	169.84
Conway	67.62	11.14	56.48
Craighead	34.67	7.56	27.11
Crawford	180.26	39.77	140.49
Crittenden	30.45	0.16	30.29
Cross	52.50	1.39	51.11
Dallas	255.01	171.16	83.86
Desha	174.20	20.34	153.86
Drew	416.31	251.11	165.20
Faulkner	68.03	5.26	62.77
Franklin	228.91	42.57	186.35
Fulton	92.43	31.89	60.53
Garland	342.09	223.99	118.10
Grant	487.17	183.67	303.50
Greene	63.20	14.14	49.06
Hempstead	402.76	239.09	163.67
Hot Spring	234.98	117.62	117.36
Howard	243.85	149.54	94.31
Independence	145.02	27.56	117.46
Izard	128.54	66.01	62.54
Jackson	33.24	0.00	33.24
Jefferson	235.21	90.38	144.83
Johnson	293.01	89.83	203.18
Lafayette	227.27	152.13	75.14
Lawrence	60.62	1.83	58.79

Table 10.—*Growing-stock volume on timberland by species group, 1985—Continued*

County	All species	Softwood	Hardwood
----- Million cubic feet -----			
Lee	168.49	2.92	165.57
Lincoln	127.49	49.93	77.56
Little River	129.77	84.34	45.43
Logan	212.99	131.34	81.65
Lonoke	39.28	0.39	38.88
Madison	235.47	13.30	222.17
Marion	61.97	8.28	53.69
Miller	116.05	63.27	52.79
Mississippi	15.85	5.32	10.53
Monroe	224.19	35.93	188.26
Montgomery	733.99	537.16	196.82
Nevada	501.39	261.01	240.38
Newton	341.25	35.94	305.31
Ouachita	512.20	245.22	266.98
Perry	264.10	188.48	75.62
Phillips	68.41	0.50	67.92
Pike	272.35	194.63	77.72
Poinsett	59.47	1.81	57.66
Polk	395.87	266.57	129.30
Pope	375.40	114.41	260.99
Prairie	99.33	8.94	90.39
Pulaski	137.62	75.11	62.51
Randolph	107.70	1.03	106.67
St. Francis	44.45	0.93	43.52
Saline	406.80	236.60	170.20
Scott	722.26	546.17	176.09
Searcy	168.61	17.74	150.87
Sebastian	51.64	13.05	38.59
Sevier	261.23	123.50	137.73
Sharp	104.19	13.21	90.98
Stone	238.69	58.36	180.34
Union	908.18	516.24	391.94
Van Buren	242.05	63.34	178.71
Washington	169.88	10.38	159.50
White	165.02	16.29	148.73
Woodruff	78.28	9.32	68.96
Yell	457.33	276.05	181.28
All counties	17225.48	7769.80	9455.68

Table 11.—*Sawtimber volume on timberland by species group, 1985*

County	All species	Softwood	Hardwood
----- Million board feet -----			
Arkansas	1024.47	137.54	886.93
Ashley	1697.81	1294.99	402.82
Baxter	445.54	86.12	359.41
Benton	462.44	26.43	436.02
Boone	246.40	15.79	230.61
Bradley	1844.45	1242.10	602.35
Calhoun	1272.54	965.65	306.89
Carroll	380.90	87.59	293.31
Chicot	339.98	0.00	339.98
Clark	1921.66	1308.91	612.75
Clay	201.03	0.00	201.03
Cleburne	556.53	340.31	216.22
Cleveland	2427.00	1360.17	1066.83

Table 11.—*Sawtimber volume on timberland by species group,
1985—Continued*

County	All species	Softwood	Hardwood
----- Million board feet -----			
Columbia	1757.79	1263.55	494.24
Conway	170.92	15.22	155.70
Craighead	107.24	34.57	72.67
Crawford	561.06	163.90	397.15
Crittenden	139.14	0.00	139.14
Cross	192.29	0.00	192.29
Dallas	1141.03	942.88	198.15
Desha	719.78	115.58	604.20
Drew	1986.79	1346.03	640.76
Faulkner	191.85	21.75	170.10
Franklin	668.83	165.10	503.73
Fulton	240.52	63.47	177.05
Garland	1180.18	977.91	202.27
Grant	2207.11	953.37	1253.74
Greene	200.23	43.13	157.10
Hempstead	1504.18	1055.41	448.76
Hot Spring	844.24	618.57	225.67
Howard	1076.96	865.08	211.88
Independence	505.96	118.88	387.08
Izard	395.39	218.77	176.62
Jackson	82.82	0.00	82.82
Jefferson	789.54	248.52	541.02
Johnson	1037.79	427.70	610.09
Lafayette	918.84	699.93	218.91
Lawrence	171.20	1.77	169.43
Lee	728.29	14.63	713.66
Lincoln	366.53	114.62	251.91
Little River	467.69	424.88	42.81
Logan	776.56	550.56	26.00
Lonoke	122.84	2.48	120.36
Madison	598.91	52.71	546.20
Marion	200.97	45.41	155.57
Miller	400.66	309.63	91.04
Mississippi	61.04	26.30	34.74
Monroe	891.27	173.43	717.84
Montgomery	2857.70	2508.14	349.56
Nevada	1963.40	1278.50	684.90
Newton	962.50	174.86	787.64
Ouachita	2165.95	1340.60	825.35
Perry	920.23	781.18	139.05
Phillips	251.99	2.19	249.80
Pike	1108.97	929.39	179.57
Poinsett	207.59	11.47	196.12
Polk	1425.89	1222.14	203.74
Pope	1217.14	475.68	741.47
Prairie	399.76	43.01	356.76
Pulaski	405.19	304.81	100.37
Randolph	292.41	3.61	288.80
St. Francis	168.03	4.18	163.85
Saline	1295.86	878.82	417.04
Scott	2645.95	2306.84	339.11
Searcy	536.67	110.01	426.67
Sebastian	138.33	49.58	88.75
Sevier	1072.34	680.08	392.26
Sharp	245.27	24.95	220.32
Stone	707.85	278.73	429.12
Union	4112.38	2733.27	1379.10
Van Buren	637.84	283.69	354.15
Washington	418.74	40.35	378.39
White	562.96	78.68	484.28
Woodruff	249.37	43.30	206.07
Yell	1535.82	1066.08	469.74
All counties	64733.30	36595.47	28137.83

Table 13.—*Growing-stock volume of softwoods on timberland by forest type, 1985*

County	All types	Loblolly-shortleaf	Oak-pine	Oak-hickory	Oak-gum-cypress	Elm-ash-cottonwood
<i>----- Million cubic feet -----</i>						
Arkansas	25.08	.....	.....	0.00	25.08	0.00
Ashley	217.88	171.27	30.22	9.38	7.01	.....
Baxter	23.93	12.47	8.11	3.35	.....	.....
Benton	3.13	.....	1.14	1.99	.....	.....
Boone	2.22	.....	0.86	1.36	.....	.....
Bradley	239.45	170.03	27.26	23.29	18.87	.....
Calhoun	198.14	114.75	37.29	12.04	34.06	.....
Carroll	16.75	.....	13.40	3.35	.....	.....
Chicot	0.00	.....	.....	0.00	0.00	0.00
Clark	268.51	173.80	67.83	17.42	9.46	.....
Clay	0.00	.....	.....	0.00	0.00	.....
Cleburne	80.28	41.63	22.66	16.00	0.00	.....
Cleveland	269.23	171.47	59.23	27.30	11.22	.....
Columbia	260.09	191.66	39.42	16.70	12.31	.....
Conway	11.14	5.30	4.25	1.60	0.00	.....
Craighead	7.56	.....	.....	0.00	4.89	2.67
Crawford	39.77	28.73	5.36	5.69	.....	.....
Crittenden	0.16	.....	.....	.....	0.00	0.16
Cross	1.39	.....	.....	1.39	0.00	0.00
Dallas	171.16	104.61	39.99	15.69	10.86	.....
Desha	20.34	.....	.....	.....	20.34	0.00
Drew	251.11	145.54	58.55	24.04	22.98	.....
Faulkner	5.26	0.50	3.49	1.26	0.00	.....
Franklin	42.57	18.14	22.32	2.12	.....	.....
Fulton	31.89	29.17	2.17	0.55	.....	.....
Garland	223.99	148.39	59.79	15.81	.....	.....
Grant	183.67	99.55	46.41	22.20	15.51	.....
Greene	14.14	.....	5.88	7.86	0.00	0.39
Hempstead	239.09	178.21	33.63	21.95	5.30	.....
Hot Spring	117.62	50.95	39.02	23.54	4.11	.....
Howard	149.54	105.05	30.41	12.86	1.21	.....
Independence	27.56	13.88	9.48	4.19	.....	.....
Izard	66.01	48.91	8.86	8.25	0.00	.....
Jackson	0.00	.....	.....	0.00	0.00	.....
Jefferson	90.38	43.77	22.27	13.32	11.02	0.00
Johnson	89.83	65.72	18.79	5.32	.....	.....
Lafayette	152.13	111.74	31.08	6.28	3.03	.....
Lawrence	1.83	.....	1.31	0.51	0.00	.....
Lee	2.92	.....	.....	0.00	2.92	0.00
Lincoln	49.93	27.26	2.61	16.39	2.58	1.08
Little River	84.34	50.33	26.23	5.05	2.37	0.36
Logan	131.34	92.72	27.57	11.06	0.00	.....
Lonoke	0.39	.....	.....	0.00	0.39	.....
Madison	13.30	2.08	9.82	1.40	.....	.....
Marion	8.28	5.86	.....	2.42	.....	.....
Miller	63.27	32.27	15.57	5.77	6.58	3.07
Mississippi	5.32	.....	.....	.....	4.26	1.06
Monroe	35.93	.....	7.82	2.40	25.72	.....
Montgomery	537.16	405.06	98.66	33.44	.....	.....
Nevada	261.01	166.01	51.80	27.59	15.61	.....
Newton	35.94	14.93	10.30	10.71	.....	0.00
Ouachita	245.22	125.33	73.56	25.07	21.26	.....
Perry	188.48	125.16	57.15	5.82	0.35	.....
Phillips	0.50	.....	.....	0.00	0.50	0.00
Pike	194.63	123.39	54.63	16.61	.....	.....
Poinsett	1.81	.....	.....	0.00	0.00	1.81
Polk	266.57	156.03	89.85	20.68	.....	.....
Pope	114.41	81.65	23.15	9.61	0.00	.....
Prairie	8.94	.....	.....	1.83	7.11	.....
Pulaski	75.11	28.04	23.04	10.60	13.43	0.00
Randolph	1.03	.....	0.00	1.03	0.00	.....
St. Francis	0.93	.....	.....	0.00	0.93	.....

Table 13.—Growing-stock volume of softwoods on timberland by forest type, 1985—Continued

County	All types	Loblolly-shortleaf	Oak-pine	Oak-hickory	Oak-gum-cypress	Elm-ash-cottonwood
----- Million cubic feet -----						
Saline	236.60	145.78	57.39	29.57	3.85	.....
Scott	546.17	448.07	65.73	31.87	0.51	.....
Searcy	17.74	9.13	5.89	2.73	.....	.....
Sebastian	13.05	.....	7.19	5.85	0.00	0.00
Sevier	123.50	85.24	21.73	10.01	5.78	0.73
Sharp	13.21	8.99	2.27	1.95	.....	.....
Stone	58.36	16.09	32.74	9.53	.....	.....
Union	516.24	345.21	119.07	24.38	27.58	.....
Van Buren	63.34	31.88	18.88	12.58	.....	.....
Washington	10.38	3.75	5.48	1.15	.....	.....
White	16.29	0.30	7.40	3.76	4.84	.....
Woodruff	9.32	.....	.....	.....	9.32	.....
Yell	276.05	214.97	50.23	10.85	0.00	0.00
All counties	7769.80	4990.75	1716.23	678.32	373.15	11.34

Table 14.—Growing-stock volume of hardwoods on timberland by forest type, 1985

County	All types	Loblolly-shortleaf	Oak-pine	Oak-hickory	Oak-gum-cypress	Elm-ash-cottonwood
----- Million cubic feet -----						
Arkansas	198.67	.....	.....	47.75	136.73	14.19
Ashley	106.97	23.30	25.08	26.12	32.48	.....
Baxter	107.08	2.17	3.80	101.11	.....	.....
Benton	134.59	.....	0.51	134.08	.....	.....
Boone	74.44	.....	4.40	70.03	.....	.....
Bradley	169.97	12.99	21.47	46.23	89.29	.....
Calhoun	94.16	12.27	14.90	16.06	50.93	.....
Carroll	100.24	.....	11.13	89.12	.....	.....
Chicot	88.38	.....	.....	2.05	67.56	18.77
Clark	231.49	35.20	50.33	54.38	91.58	.....
Clay	63.23	.....	.....	4.83	58.40	.....
Cleburne	101.25	9.27	20.51	64.99	6.48	.....
Cleveland	263.90	30.55	35.04	72.65	125.66	.....
Columbia	169.84	29.85	24.46	31.44	84.10	.....
Conway	56.48	4.90	7.41	24.87	19.30	.....
Craighead	27.11	.....	.....	7.99	17.51	1.61
Crawford	140.49	1.94	16.91	121.64	.....	.....
Crittenden	30.29	.....	.....	.....	5.79	24.50
Cross	51.11	.....	.....	33.27	13.09	4.74
Dallas	83.86	14.64	17.53	18.38	33.32	.....
Desha	153.86	.....	.....	.....	118.17	35.69
Drew	165.20	15.76	35.05	58.77	55.62	.....
Faulkner	62.77	0.34	4.13	40.23	18.07	.....
Franklin	186.35	2.20	13.54	170.60	.....	.....
Fulton	60.53	1.22	0.45	58.86	.....	.....
Garland	118.10	25.96	33.73	58.41	.....	.....
Grant	303.50	26.54	29.34	69.10	178.52	.....
Greene	49.06	.....	4.74	30.34	9.47	4.51
Hempstead	163.67	26.94	15.41	70.67	50.66	.....
Hot Spring	117.36	14.59	23.32	58.25	21.19	.....
Howard	94.31	24.72	24.26	32.14	13.19	.....
Independence	117.46	3.07	14.63	99.75	.....	.....
Izard	62.54	8.97	6.34	44.23	3.00	.....

Table 14.—*Growing-stock volume of hardwoods on timberland by forest type, 1985—Continued*

County	All types	Loblolly- shortleaf	Oak-pine	Oak-hickory	Oak-gum- cypress	Elm-ash- cottonwood
<i>Million cubic feet</i>						
Jackson	33.24	.....	.....	14.12	19.12	.....
Jefferson	144.83	7.63	17.63	40.29	57.87	21.41
Johnson	203.18	10.15	22.95	170.08	.....	.....
Lafayette	75.14	21.23	29.03	6.53	18.35	.....
Lawrence	58.79	.....	2.20	25.14	31.45	.....
Lee	165.57	.....	.....	24.79	113.13	27.64
Lincoln	77.56	2.63	1.30	36.96	30.32	6.35
Little River	45.43	8.12	15.07	10.66	11.27	0.31
Logan	81.65	13.01	13.76	42.00	12.88	.....
Lonoke	38.88	.....	.....	12.59	26.29	.....
Madison	222.17	2.63	6.98	212.55	.....	.....
Marion	53.69	1.55	.....	52.14	.....	.....
Miller	52.79	7.92	10.88	9.55	20.71	3.72
Mississippi	10.53	.....	.....	.....	6.91	3.62
Monroe	188.26	.....	8.04	7.83	172.39	.....
Montgomery	196.82	51.22	62.28	83.32	.....	.....
Nevada	240.38	28.63	56.48	66.54	88.74	.....
Newton	305.31	3.87	11.63	283.49	.....	6.32
Ouachita	266.98	29.34	37.08	59.25	141.31	.....
Perry	75.62	15.24	28.87	19.25	12.25	.....
Phillips	67.92	.....	.....	19.44	43.50	4.97
Pike	77.72	21.36	40.75	15.59	.....	.....
Poinsett	57.66	.....	.....	16.92	32.87	7.86
Polk	129.30	28.76	49.70	50.85	.....	.....
Pope	260.99	18.16	27.33	206.85	8.65	.....
Prairie	90.39	.....	.....	19.17	71.22	.....
Pulaski	62.51	2.27	16.60	29.80	13.83	0.00
Randolph	106.67	.....	3.14	86.43	17.10	.....
St. Francis	43.52	.....	.....	1.81	41.71	.....
Saline	170.20	15.44	41.84	61.96	50.95	.....
Scott	176.09	39.80	39.39	84.23	12.68	.....
Searcy	150.87	1.78	6.95	142.14	.....	.....
Sebastian	38.59	.....	2.57	33.27	1.68	1.08
Sevier	137.73	17.67	18.72	40.99	49.51	10.83
Sharp	90.98	2.63	6.44	81.91	.....	.....
Stone	180.34	4.26	29.95	146.12	.....	.....
Union	391.94	66.83	97.69	56.02	171.40	.....
Van Buren	178.71	6.74	20.73	151.24	.....	.....
Washington	159.50	1.13	3.32	155.04	.....	.....
White	148.73	0.50	4.67	65.37	78.20	.....
Woodruff	68.96	.....	.....	.....	68.96	.....
Yell	181.28	34.25	26.96	48.23	70.06	1.79
All counties	9455.68	792.20	1219.36	4448.79	2795.41	199.92

Table 15.—Sawtimber volume of softwoods on timberland by forest type, 1985

County	All types	Loblolly- shortleaf	Oak-pine	Oak-hickory	Oak-gum- cypress	Elm-ash- cottonwood
----- Million board feet -----						
Arkansas	137.54	.....	.....	0.00	137.54	0.00
Ashley	1294.99	1013.59	166.19	64.81	50.40	.....
Baxter	86.12	30.64	29.22	26.27	.....	.....
Benton	26.43	.....	4.23	22.19	.....	.....
Boone	15.79	.....	2.30	13.49	.....	.....
Bradley	1242.10	820.75	147.05	148.17	126.14	.....
Calhoun	965.65	476.72	217.24	74.45	197.25	.....
Carroll	87.59	.....	61.39	26.20	.....	.....
Chicot	0.00	.....	.....	0.00	0.00	0.00
Clark	1308.91	820.21	328.93	103.14	56.63	.....
Clay	0.00	.....	.....	0.00	0.00	.....
Cleburne	340.31	145.90	94.53	99.81	0.08	.....
Cleveland	1360.17	797.61	336.17	153.87	72.51	.....
Columbia	1263.55	908.45	187.43	90.14	77.53	.....
Conway	15.22	3.86	7.07	4.23	0.06	.....
Craighead	34.57	.....	.....	0.00	20.46	14.11
Crawford	163.90	125.82	14.08	24.00	.....	.....
Crittenden	0.00	.....	.....	.....	0.00	0.00
Cross	0.00	.....	.....	0.00	0.00	0.00
Dallas	942.88	544.83	223.18	103.98	70.89	.....
Desha	115.58	.....	.....	.....	115.58	0.00
Drew	1346.03	727.77	334.31	153.10	130.85	.....
Faulkner	21.75	1.71	9.17	10.67	0.20	.....
Franklin	165.10	52.83	82.97	29.30	.....	.....
Fulton	63.47	36.83	12.61	14.03	.....	.....
Garland	977.91	597.14	301.46	79.31	.....	.....
Grant	953.37	495.19	245.60	112.62	99.96	.....
Greene	43.13	.....	24.89	17.34	0.00	0.90
Hempstead	1055.41	750.95	140.95	129.31	34.20	.....
Hot Spring	618.57	241.81	213.11	137.26	26.38	.....
Howard	865.08	599.53	175.86	81.24	8.46	.....
Independence	118.88	58.53	24.72	35.63	.....	.....
Izard	218.77	131.56	28.98	58.12	0.10	.....
Jackson	0.00	.....	.....	0.00	0.00	.....
Jefferson	248.52	122.23	61.98	25.60	38.71	0.00
Johnson	427.70	293.98	92.36	41.36	.....	.....
Lafayette	699.93	472.98	168.63	38.11	20.21	.....
Lawrence	1.77	.....	1.77	0.00	0.00	.....
Lee	14.63	.....	.....	0.00	14.63	0.00
Lincoln	114.62	84.99	1.20	22.87	1.52	4.04
Little River	424.88	235.05	142.37	29.03	15.90	2.53
Logan	550.56	401.10	113.33	36.13	0.00	.....
Lonoke	2.48	.....	.....	0.00	2.48	.....
Madison	52.71	6.26	33.94	12.50	.....	.....
Marion	45.41	17.56	.....	27.85	.....	.....
Miller	309.63	164.27	61.42	30.86	38.76	14.30
Mississippi	26.30	.....	.....	.....	19.75	6.55
Monroe	173.43	.....	14.40	7.85	151.17	.....
Montgomery	2508.14	1884.34	468.98	154.82	.....	.....
Nevada	1278.50	769.12	235.87	171.71	101.80	.....
Newton	174.86	58.97	37.36	76.42	.....	2.10
Ouachita	1340.60	609.39	434.71	151.35	145.15	.....
Perry	781.18	504.07	250.83	25.98	0.30	.....
Phillips	2.19	.....	.....	0.00	2.19	0.00
Pike	929.39	564.76	269.42	95.21	.....	.....
Poinsett	11.47	.....	.....	0.00	0.00	11.47
Polk	1222.14	740.29	380.75	101.10	.....	.....
Pope	475.68	302.15	91.73	81.73	0.07	.....
Prairie	43.01	.....	.....	0.00	43.01	.....
Pulaski	304.81	114.63	101.33	37.28	51.57	0.00
Randolph	3.61	.....	0.11	3.29	0.22	.....
St. Francis	4.18	.....	.....	0.00	4.18	.....

Table 15.—Sawtimber volume of softwoods on timberland by forest type, 1985—Continued

County	All types	Loblolly-shortleaf	Oak-pine	Oak-hickory	Oak-gum-cypress	Elm-ash-cottonwood
<i>Million board feet</i>						
Saline	878.82	523.82	215.91	122.55	16.55	.....
Scott	2306.84	1865.10	292.58	146.57	2.60	.....
Searcy	110.01	40.47	29.61	39.93	.....	.....
Sebastian	49.58	.....	22.37	27.21	0.00	0.00
Sevier	680.08	461.51	115.94	60.70	36.88	5.05
Sharp	24.95	8.83	6.04	10.08	.....	.....
Stone	278.73	44.75	154.89	79.09	.....	.....
Union	2733.27	1731.46	673.54	156.59	171.68	.....
Van Buren	283.69	112.13	68.96	102.59	.....	.....
Washington	40.35	10.12	19.98	10.25	.....	.....
White	78.68	1.19	22.70	29.57	25.21	.....
Woodruff	43.30	.....	.....	.....	43.30	.....
Yell	1066.08	840.83	185.92	39.33	0.00	0.00
All counties	36595.47	22368.59	8184.58	3808.17	2173.07	61.06

Table 16.—Sawtimber volume of hardwoods on timberland by forest type, 1985

County	All types	Loblolly-shortleaf	Oak-pine	Oak-hickory	Oak-gum-cypress	Elm-ash-cottonwood
<i>Million board feet</i>						
Arkansas	986.93	.....	.....	189.61	626.93	70.39
Ashley	402.82	77.49	104.80	74.88	145.65	.....
Baxter	359.41	1.96	10.94	346.51	.....	.....
Benton	436.02	.....	1.87	434.14	.....	.....
Boone	230.61	.....	11.71	218.90	.....	.....
Bradley	602.35	46.64	65.13	136.73	353.84	.....
Calhoun	306.89	31.28	51.82	50.11	173.68	.....
Carroll	293.31	.....	44.55	248.76	.....	.....
Chicot	339.98	.....	.....	10.16	293.39	36.44
Clark	612.75	70.55	97.43	148.27	296.51	.....
Clay	201.03	.....	.....	8.83	192.20	.....
Cleburne	216.22	18.01	49.84	131.99	16.38	.....
Cleveland	1066.83	73.88	125.61	260.27	607.07	.....
Columbia	494.24	72.66	69.28	76.77	275.52	.....
Conway	155.70	19.33	14.77	68.41	53.19	.....
Craighead	72.67	.....	.....	14.95	52.10	5.62
Crawford	397.15	4.91	47.61	344.64	.....	.....
Crittenden	139.14	.....	.....	.....	19.29	119.86
Cross	192.29	.....	.....	135.87	48.69	7.73
Dallas	198.15	31.81	32.69	41.92	91.73	.....
Desha	604.20	.....	.....	.....	473.63	130.57
Drew	640.76	37.98	114.51	254.68	233.59	.....
Faulkner	170.10	1.23	5.64	102.86	60.37	.....
Franklin	503.73	6.63	20.80	476.31	.....	.....
Fulton	177.05	3.26	1.63	172.16	.....	.....
Garland	202.27	27.60	64.44	110.23	.....	.....
Grant	1253.74	71.51	80.87	244.92	856.43	.....
Greene	157.10	.....	13.07	100.21	33.27	10.55
Hempstead	448.76	77.18	44.11	197.21	130.26	.....
Hot Spring	225.67	36.19	43.98	122.67	22.84	.....
Howard	211.88	58.73	57.41	81.45	14.30	.....
Independence	387.08	8.82	34.33	343.93	.....	.....
Izard	176.62	23.89	12.94	129.05	10.75	.....

Table 16.—Sawtimber volume of hardwoods on timberland by forest type, 1985—Continued

County	All types	Loblolly- shortleaf	Oak-pine	Oak-hickory	Oak-gum- cypress	Elm-ash- cottonwood
----- Million board feet -----						
Jackson	82.82	.....	.....	24.22	58.60	.....
Jefferson	541.02	23.11	52.81	100.98	224.06	140.07
Johnson	610.09	27.06	39.09	543.94	.....	.....
Lafayette	218.91	46.78	108.96	13.34	49.84	.....
Lawrence	169.43	.....	6.93	56.90	105.61	.....
Lee	713.66	.....	.....	108.70	460.06	144.90
Lincoln	251.91	7.98	4.58	112.91	107.51	18.92
Little River	42.81	7.70	15.49	8.21	11.30	0.11
Logan	226.00	32.53	26.36	122.69	44.42	.....
Lonoke	120.36	.....	.....	33.82	86.54	.....
Madison	546.20	8.95	13.99	523.27	.....	.....
Marion	155.57	6.12	.....	149.45	.....	.....
Miller	91.04	15.98	14.91	15.24	34.02	10.88
Mississippi	34.74	.....	.....	.....	16.90	17.84
Monroe	717.84	.....	27.29	27.77	662.78	.....
Montgomery	349.56	95.85	109.13	144.59	.....	.....
Nevada	684.90	81.46	102.01	165.23	336.20	.....
Newton	787.64	13.50	31.88	708.20	.....	34.06
Ouachita	825.35	58.83	71.38	133.83	561.30	.....
Perry	139.05	29.48	27.17	39.01	43.39	.....
Phillips	249.80	.....	.....	88.26	155.52	6.01
Pike	179.57	43.87	104.03	31.67	.....	.....
Poinsett	196.12	.....	.....	50.66	110.01	35.44
Polk	203.74	40.62	92.14	70.98	.....	.....
Pope	741.47	44.00	63.72	592.84	40.91	.....
Prairie	356.76	.....	.....	70.34	286.42	.....
Pulaski	100.37	4.66	23.20	51.20	21.09	0.22
Randolph	288.80	.....	5.11	225.42	58.27	.....
St. Francis	163.85	.....	.....	4.18	159.68	.....
Saline	417.04	40.94	103.16	123.75	149.20	.....
Scott	339.11	67.89	60.09	177.75	33.37	.....
Searcy	426.67	5.09	11.98	409.60	.....	.....
Sebastian	88.75	.....	15.68	68.50	4.22	0.35
Sevier	392.26	31.31	51.74	106.21	176.34	26.66
Sharp	220.32	9.58	13.24	197.50	.....	.....
Stone	429.12	10.05	99.15	319.92	.....	.....
Union	1379.10	205.40	273.27	215.01	685.41	.....
Van Buren	354.15	13.59	54.22	286.34	.....	.....
Washington	378.39	3.75	10.50	364.14	.....	.....
White	484.28	1.79	7.94	140.73	333.81	.....
Woodruff	206.07	.....	.....	.....	206.07	.....
Yell	469.74	55.07	43.14	117.77	249.94	3.83
All counties	28137.83	1834.44	2906.10	12022.46	10554.38	820.45

Table 27.—*Net average annual growing stock and sawtimber removals on timberland by species groups, 1985*

County	Growing Stock			Sawtimber		
	Total	Softwood	Hardwood	Total	Softwood	Hardwood
	----- Million cubic feet -----			----- Million board feet -----		
Arkansas	1.35	0.00	1.35	6.04	0.00	6.04
Ashley	36.26	27.99	8.27	161.05	136.39	24.66
Baxter	0.53	0.28	0.25	2.40	1.21	1.19
Benton	0.60	0.02	0.58	2.87	0.07	2.80
Boone	0.90	0.02	0.88	4.17	0.08	4.10
Bradley	23.11	16.50	6.61	107.13	83.20	23.94
Calhoun	16.59	9.11	7.48	68.45	41.92	26.53
Carroll	0.37	0.03	0.34	1.80	0.17	1.62
Chicot	1.46	0.00	1.46	5.70	0.00	5.70
Clark	30.94	20.48	10.45	148.40	108.86	39.54
Clay	0.99	0.00	0.99	4.57	0.00	4.57
Cleburne	2.70	1.86	0.84	10.79	7.37	3.41
Cleveland	20.60	12.64	7.96	90.23	61.51	28.73
Columbia	19.52	13.42	6.10	79.71	57.22	22.49
Conway	3.63	2.33	1.29	15.17	10.38	4.79
Craighead	0.68	0.00	0.68	3.11	0.01	3.10
Crawford	0.70	0.00	0.69	3.33	0.03	3.30
Crittenden	0.46	0.00	0.46	1.82	0.00	1.82
Cross	0.51	0.08	0.43	1.97	0.00	1.97
Dallas	32.36	20.19	12.16	139.17	98.33	40.84
Desha	3.52	0.03	3.49	14.92	0.15	14.78
Drew	22.58	13.22	9.36	91.00	62.83	28.17
Faulkner	0.86	0.46	0.40	3.78	2.05	1.72
Franklin	1.75	1.16	0.58	8.25	5.86	2.40
Fulton	0.64	0.15	0.49	2.93	0.59	2.34
Garland	11.33	9.09	2.24	58.55	48.97	9.58
Grant	18.05	9.85	8.20	79.32	48.61	30.71
Greene	0.73	0.01	0.71	3.36	0.08	3.28
Hempstead	13.42	9.52	3.90	59.93	46.42	13.51
Hot Spring	16.82	12.93	3.89	82.41	67.92	14.49
Howard	26.65	21.03	5.61	136.24	113.23	23.00
Independence	1.99	0.86	1.13	8.61	3.59	5.02
Izard	1.94	0.57	1.37	8.51	2.06	6.45
Jackson	0.75	0.00	0.75	3.13	0.00	3.13
Jefferson	7.67	4.84	2.83	33.26	23.24	10.01
Johnson	3.06	2.11	0.95	13.28	9.92	3.36
Lafayette	10.01	7.41	2.60	41.63	33.09	8.54
Lawrence	1.31	0.00	1.31	6.33	0.00	6.33
Lee	2.51	0.00	2.51	11.37	0.01	11.36
Lincoln	7.01	3.25	3.77	24.97	13.74	11.22
Little River	14.86	9.79	5.06	65.23	47.47	17.76
Logan	3.42	2.78	0.63	15.41	13.49	1.92
Lonoke	1.24	0.03	1.21	5.21	0.12	5.08
Madison	2.87	0.06	2.81	13.51	0.31	13.19
Marion	0.52	0.04	0.48	2.48	0.18	2.30
Miller	7.22	3.73	3.48	29.64	17.00	12.65
Mississippi	0.09	0.00	0.09	0.40	0.00	0.40
Monroe	3.43	0.02	3.41	15.66	0.10	15.56
Montgomery	6.24	4.81	1.44	29.17	23.70	5.47
Nevada	19.84	13.19	6.65	85.13	62.40	22.73
Newton	2.31	0.35	1.97	10.86	1.70	9.16
Ouachita	24.25	12.71	11.55	100.73	56.74	44.00
Perry	7.42	6.16	1.26	37.27	32.47	4.80
Phillips	3.17	0.00	3.17	15.06	0.01	15.05
Pike	26.98	22.86	4.12	138.20	121.96	16.24
Poinsett	0.23	0.00	0.23	1.06	0.00	1.06
Polk	13.38	11.18	2.19	63.91	56.14	7.77
Pope	5.31	3.60	1.71	23.47	17.23	6.23
Prairie	1.11	0.01	1.10	4.98	0.04	4.94
Pulaski	3.82	2.13	1.69	16.37	10.53	5.84

Table 27.—*Net average annual growing stock and sawtimber removals on timberland by species groups, 1985—Continued*

County	Growing Stock			Sawtimber		
	Total	Softwood	Hardwood	Total	Softwood	Hardwood
	----- Million cubic feet -----			----- Million board feet -----		
Randolph	1.43	0.01	1.41	6.87	0.05	6.82
St. Francis	1.51	0.01	1.50	7.19	0.06	7.13
Saline	13.83	8.58	5.25	60.89	41.98	18.91
Scott	6.41	5.61	0.80	29.15	26.53	2.62
Searcy	1.33	0.28	1.05	6.12	1.30	4.82
Sebastian	0.19	0.17	0.01	0.82	0.77	0.05
Sevier	18.47	14.11	4.36	93.73	76.39	17.34
Sharp	1.34	0.06	1.29	6.34	0.26	6.08
Stone	1.69	0.58	1.11	7.71	2.36	5.36
Union	30.33	21.82	8.51	132.55	102.09	30.46
Van Buren	3.41	2.59	0.83	14.45	11.50	2.96
Washington	1.59	0.00	1.59	7.33	0.00	7.33
White	2.97	0.66	2.31	12.56	2.18	10.38
Woodruff	1.13	0.00	1.13	5.09	0.00	5.09
Yell	11.94	9.91	2.04	58.70	51.48	7.22
All counties	592.14	379.32	212.82	2672.92	1867.64	805.27

Beltz, Roy C.; Leister, Randall; Smith, Walter R. Midcycle survey of Arkansas' forest resources. Resour. Bull. SO-123. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 1987. 19 p.

Tabulates forest resource information from a midcycle survey of Arkansas' forests.

Additional Keywords: Area, volume, Landsat, softwoods, hardwoods

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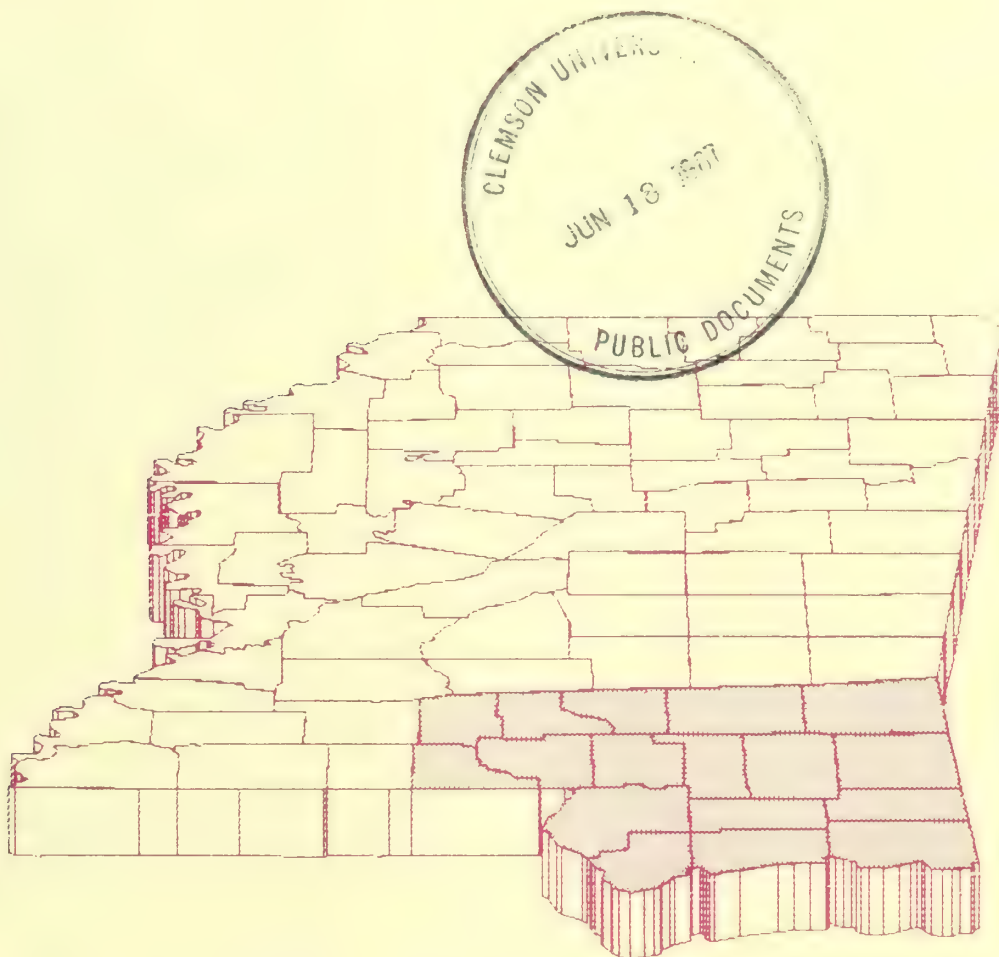
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Forest Statistics for South Mississippi Counties - 1987

John F. Kelly and F. Dee Hines



SUMMARY

The 1987 survey of the 17 counties in the South Mississippi unit indicated the following changes since the previous survey in 1977:

- * Timberland area, now covering 4,329.0 thousand acres, is approximately the same.
- * Publicly owned land, excluding National Forest lands which did not change, increased by 90.5 thousand acres; forest industry lands decreased by 114.0 thousand acres.
- * Pine forest types decreased by 9 percent, all due to decline of the longleaf-slash pine type.
- * Oak-pine and oak-hickory forest types increased by 5 percent and 24 percent respectively.
- * Sapling-seedling stands decreased by 5 percent; poletimber stands and sawtimber stands increased by 4 percent and 6 percent respectively.
- * Planted area increased by 347.2 thousand acres and now accounts for 24 percent of all timberland.
- * Softwood growing-stock volume increased by only 2 percent.
- * Hardwood growing-stock volume increased by 25 percent.
- * Net growth of softwood growing stock decreased by 8 percent.
- * Net growth of hardwood growing stock increased by 39 percent.
- * Removals of growing stock increased 16 percent. Softwood removals increased only 12 percent, but are now about equal to net growth; hardwood removals increased by 34 percent.
- * Mortality of growing stock remained about the same since the previous survey.

FOREWORD

The Southern Forest Survey, an activity of the Southern Forest Experiment Station Forest Inventory and Analysis work unit, covers the States of Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, Tennessee, and East Texas, and the island of Puerto Rico.

This survey is part of the nationwide Forest Survey originally authorized by the McSweeney-McNary Act of 1928. More recent legislation pertinent to the survey mission includes the Forest and Rangeland Renewable Resources Planning Act of 1974 and the Forest and Rangeland Renewable Resources Research Act of 1978. The survey mission is to develop, analyze, and maintain renewable forest resource information. This information is essential for formulation of forest policies and programs.

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*Core tables are presented in response to the Southern Industrial Forestry Research Council's recommendations. These tables are identical among Forest Inventory and Analysis units in the eastern United States.



Figure I.—The forest survey regions of Mississippi

Forest Statistics for South Mississippi Counties—1987

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INTRODUCTION

The tables in this report were derived from data obtained from an inventory of 17 counties comprising the South Unit of Mississippi (Fig. I). The data on forest acreage and timber volume were secured by a three-step process. A forest-nonforest classification was accomplished on aerial photographs for points representing approximately 230 acres. These photo classifications were adjusted on the basis of ground observations at sample locations representing approximately 3,840 acres. Finally, forest locations at the intersections of a grid of lines spaced 3 miles apart were subjected to on-the-ground measurements. At these forest locations, per-acre estimates were obtained from trees measured on ten 37.5 basal area factor prism points.

The sampling methods were designed to achieve suitable sampling errors for estimates of area and volume at the State level. Sampling error increases as the area or volume considered decreases. The sampling errors presented in Table I, equal to one standard deviation for the sample data, may be used to construct confidence intervals for population parameters. For example, at the 95% confidence level, the confidence interval for growing-stock volume (in million cubic feet) in South Mississippi (with a sampling error of 3.5%) is

$$4,042.9 \pm 1.96(0.035 \times 4,042.9) = 4,042.9 \pm 277.3$$

where 1.96 is the number of standard deviations. This confidence interval indicates that the actual growing-stock volume lies in the range 3,765.6 to 4,320.2 million cubic feet,

Table I—Sampling errors¹ for timberland, growing stock, and sawtimber, South Mississippi, 1987

County	Timberland	Growing stock			Sawtimber volume
		Volume	Growth	Removals	
		----- <i>Percent</i> -----			
Covington	2.3	24.7	25.0	19.1	30.2
Forrest	3.2	12.4	9.5	12.2	14.4
George	3.4	15.5	17.8	24.0	16.6
Greene	1.5	11.5	8.2	16.8	15.7
Hancock	2.8	17.4	17.3	27.0	21.6
Harrison	2.2	13.4	12.4	22.3	16.6
Jackson	2.4	14.1	16.0	20.4	16.3
Jefferson Davis	3.7	17.4	26.6	32.3	22.7
Jones	2.1	10.0	7.5	24.3	12.7
Lamar	2.5	17.8	13.2	27.5	22.2
Lawrence	2.1	15.1	13.6	22.2	19.8
Marion	2.1	11.6	9.9	15.9	13.4
Pearl River	2.1	11.5	12.1	16.4	14.7
Perry	1.8	10.2	11.8	13.5	11.8
Stone	2.1	10.5	11.0	18.0	12.9
Walthall	2.8	22.3	19.4	37.4	24.8
Wayne	1.6	10.9	8.7	12.7	13.3
All counties	0.6	3.5	3.2	5.6	4.4

¹ By random-sampling formula.

unless a 1 in 20 chance of a random event has occurred.

Sampling errors for sub-groups of counties in the unit may be estimated by the following:

$$SE_g = \frac{SE_t \sqrt{X_t}}{\sqrt{X_g}}$$

where:

- SE = standard error of estimate
(expressed as a percent)
- X = variable of interest
(area or volume)
- g = group of counties to be combined
- t = total for the unit

For comparative purposes, the 1977 survey data, collected from the last complete forest survey of Mississippi, was reprocessed according to current procedures. These procedures included the use of the same methods for estimating growth and removals. Thus, differences between the 1977 and 1987 data should reflect resource changes and not data processing differences. The results from the reprocessed 1977 survey data were used for comparison to the 1987 data in the Highlights that follow.

HIGHLIGHTS

Timberland Area

The total timberland in Mississippi's South Unit is 4,329.0 thousand acres, which is about the same as the 4,320.7 thousand acres recorded in 1977. The unit is 71 percent forested.

Changes in ownership of timberland are notable only for other public lands and forest industry. Other public lands have increased from 98.0 thousand acres in 1977 to 188.5 thousand acres in 1987. Forest industry decreased by 10 percent, or 114.0 thousand acres. Other private timberland, which showed a 1 percent increase, accounts for 59 percent of total timberland; forest industry, including land under long-term lease, ac-

counts for 25 percent; and all publicly owned timberland, including 535.7 thousand acres of National Forests, accounts for 17 percent.

Changes in forest types have occurred since the 1977 survey. Pine forest types have decreased overall by 9 percent, but virtually all of this decrease is accounted for by the change in the longleaf-slash pine type which decreased from 1,005.4 thousand acres to 819.2 thousand acres. The loblolly-shortleaf pine forest type increased slightly (by 12.6 thousand acres) to 865.3 thousand acres. A small increase of 5 percent occurred for the oak-pine type which now covers 1,099.1 thousand acres. The largest change was the 24 percent increase in the oak-hickory type, from 661.9 thousand acres in 1977 to 818.1 thousand acres in 1987. The area of oak-gum-cypress forest type decreased 4 percent, from 748.9 thousand acres to 721.8 thousand acres.

The forests in South Mississippi are shifting from sapling-seedling stands to poletimber and sawtimber stands, but changes are small. Sapling-seedling stands now cover 1,550.9 thousand acres, a 5 percent decrease from 1,637.0 thousand acres in 1977. Both poletimber and sawtimber stands have increased in the past 10 years, by 4 percent and 6 percent respectively. Sawtimber stands, covering 1,644.7 thousand acres, now account for 38 percent of timberland area.

The slight decrease in sapling-seedling stands occurred in spite of a large increase in plantation area. Planted stands increased 347.2 thousand acres, from 690.7 thousand acres in 1977 to 1,037.9 thousand acres currently. Planted stands now account for 24 percent of timberland area.

Number of Trees

Changes in numbers of trees generally reflect a trend towards more large sawtimber trees, and this trend is evident for both live and growing-stock softwood trees. The number of sapling-size softwood live trees has decreased by 3 percent since 1977; sapling-size softwood growing-stock trees decreased

by 9 percent. Decreases are evident for softwood trees up through the 12-inch diameter-at-breast-height (dbh) class; the number of trees in the 14-inch and larger classes has increased since the previous survey.

While the number of live hardwood trees has increased for most dbh classes, the number of hardwood growing-stock trees has decreased in all dbh classes below the 8-inch class. The decrease in hardwood growing-stock trees is especially evident in sapling-size trees where there was a 55 percent decrease. The number of hardwood growing-stock trees increased in the 8-inch and larger dbh classes.

Timber Volume

Softwood volumes have increased slightly from 1977 to 1987, with growing-stock volume increasing somewhat less than in the previous survey period. The current survey shows an increase of 2 percent in softwood growing-stock volume since 1977, which compares to the 10 percent increase which occurred from 1967 to 1977. Softwood sawtimber increased 6 percent in the current survey, and also 6 percent in the previous period. Softwood growing-stock volume is now 2,442.7 million cubic feet, and sawtimber volume is 9,679.0 million board feet.

Hardwood volumes, however, have increased more in the current survey than in the previous period. Hardwood growing-stock volume has increased 25 percent since 1977, from 1,283.0 million cubic feet to 1,600.2 million cubic feet. Hardwood sawtimber volume has similarly increased 27 percent, from 3,536.8 million board feet in 1977 to 4,498.1 million board feet in 1987. For the previous survey period—1967 to 1977—hardwood growing stock increased only 7 percent and sawtimber only 3 percent.

The volume of cull trees has increased by 32.7 million cubic feet since 1977; most of this 6 percent increase is due to softwood trees. Softwood cull volume has increased 37 percent to 78.3 million cubic feet. Hardwood cull volume has increased only 2 percent to 487.0 million cubic feet.

Growth, Removals, and Mortality

Although total net annual growth has increased slightly by 3 percent, softwood and hardwood trends are different. Growth is calculated as an annual average for the inter-survey period; removals and mortality are similarly calculated. Average net annual growth of softwood growing stock is 143.2 million cubic feet. This is a decrease of 8 percent from the 1977 estimate of 155.0 million cubic feet. Average net annual growth on hardwood growing stock is currently at 63.8 million cubic feet, up 39 percent from the 1977 estimate of 45.8 million cubic feet.

Removals have increased 16 percent since 1977, with softwoods and hardwoods showing increases. Softwood removals from growing stock are up 12 percent, from the 1977 estimate of 127.6 million cubic feet to the current estimate of 142.7 million cubic feet. Softwood removals are now about equal to net growth. Hardwood growing-stock removals are up 34 percent, from 26.2 million cubic feet to 35.1 million cubic feet.

There has been virtually no change in mortality since the previous survey. The 1987 survey shows 40.9 million cubic feet of annual mortality, while the 1977 survey shows 41.5 million cubic feet. Although the current survey shows a 4 percent decrease in mortality for softwoods and a 4 percent increase in mortality for hardwoods, such small changes are not statistically significant. Softwood mortality now accounts for 63 percent of total mortality in the South Mississippi unit.

Tables 1–25 were developed to provide compatibility among Forest Inventory and Analysis Projects. Tables 26–36 are supplementary tables and may change from unit to unit or state to state to address specific resource issues.

DEFINITION OF TERMS

Average net annual growth.—Average net annual volume increase for the inter-survey period.

Average annual mortality.—Average annual sound-wood volume of growing-stock trees dying from natural causes.

Average annual removals.—Average net annual volume of growing-stock trees removed from the inventory by harvesting, cultural operations (such as timber-stand improvement), land clearing, or changes in land use.

Forest type.—A classification of forest land based upon the species forming a plurality of live-tree stocking.

Growing-stock trees.—Live trees of commercial species. Rough and rotten trees are excluded.

Growing-stock volume.—The cubic-foot volume of sound wood in growing-stock trees at least 5.0 inches in diameter at breast height, from a 1-foot stump to a minimum 4.0-inch top diameter outside bark of the central stem, or to the point where the central stem breaks into limbs.

Noncommercial species.—Tree species of typically small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products.

Poletimber trees.—Growing-stock trees of commercial species at least 5.0 inches in diameter at breast height, but smaller than sawtimber size.

Rotten trees.—Live trees of commercial species that do not contain at least one 12-foot saw log, now or prospectively, primarily because of rot.

Reserved timberland.—Productive public forest land withdrawn from timber utilization through statute or administrative regulations.

Rough trees.—Live trees of commercial species that do not contain at least one 12-foot saw log, now or prospectively, primarily because of roughness or poor form. Also included are all live trees of noncommercial species.

Sawtimber trees.—Live trees that are of commercial species, contain at least a 12-foot saw log, and meet regional specifications for freedom from defect. Softwoods must be at least 9.0 inches in diameter at breast height and hardwoods at least 11.0 inches in diameter at breast height.

Sawtimber volume.—Sound-wood volume of the saw-log portion of live sawtimber trees in board feet, International 1/4-inch rule and in cubic feet.

Site class.—A classification of forest land in terms of inherent capacity to grow crops of industrial wood.

Stand-size class.—A classification of forest land based on the size class of growing-stock trees on the sampled area; that is, sawtimber, poletimber, or sapling and seedling.

Timberland.—Forest land that is producing, or is capable of producing, crops of industrial wood and not withdrawn from timber utilization. Timberland is synonymous with "commercial forest land" in prior reports.

Tree grade.—A classification of the volume of the saw-log portion of sawtimber trees, based on the log grade of the butt log.

Woodland.—Forest land incapable of yielding crops of industrial wood because of adverse site conditions.

Core Tables 1-25

Table 1—Area by county and land class, South Mississippi, 1987

County	All land ¹	Forest land			Reserved timberland	Nonforest land
		Total	Timberland ²	Woodland ³		
----- <i>Thousand acres</i> -----						
Covington	266.5	160.6	160.6	...	...	105.9
Forrest	300.0	218.3	218.3	...	...	81.7
George	309.0	222.6	222.6	...	...	86.4
Greene	459.4	383.8	382.9	...	0.9	75.6
Hancock	306.0	200.4	200.4	...	...	105.5
Harrison	371.6	253.5	253.5	...	...	118.1
Jackson	468.1	336.9	336.9	...	...	131.2
Jefferson Davis	261.6	143.1	143.1	...	...	118.5
Jones	445.1	295.5	295.5	...	...	149.6
Lamar	319.5	222.7	222.7	...	...	96.8
Lawrence	278.3	203.3	203.3	...	...	75.0
Marion	350.7	211.4	211.4	...	...	139.3
Pearl River	523.8	340.1	340.1	...	...	183.6
Perry	416.4	356.0	351.5	...	4.6	60.3
Stone	285.3	228.4	228.4	...	...	56.9
Walthall	258.8	129.3	129.3	...	...	129.5
Wayne	520.2	428.4	428.4	...	...	91.8
All counties	6140.3	4334.5	4329.0	...	5.5	1805.9

¹ From U.S. Bureau of the Census.

² Forest land (formerly termed commercial forest land) that is producing or capable of producing at least 20 cubic feet of industrial wood per acre per year. Includes areas which may be inaccessible or inoperable by current standards. Excludes reserved timberlands.

³ Forest land incapable of producing 20 cubic feet of industrial wood per acre per year under natural conditions because of adverse site condition.

Table 2—Area of timberland by county and ownership class, South Mississippi, 1987

County	All ownerships	National forest	Misc. federal	State	County and municipal	Forest industry ¹	Farmer	Corporate ²	Individual ²
----- Thousand acres -----									
Covington	160.6	...	...	...	...	27.9	34.9	...	97.7
Forrest	218.3	44.6	...	...	9.9	19.8	9.9	24.8	109.1
George	222.6	12.4	...	43.3	...	61.8	43.3	30.9	30.9
Greene	382.9	35.3	...	10.1	...	131.0	80.6	...	125.9
Hancock	200.4	...	11.5	...	...	57.3	5.7	5.7	120.3
Harrison	253.5	55.8	...	5.1	15.2	71.0	10.1	15.2	81.1
Jackson	336.9	28.6	22.8	34.3	...	85.7	11.4	34.3	119.9
Jefferson Davis	143.1	...	...	...	...	49.5	88.1	...	5.5
Jones	295.5	46.0	...	...	...	32.8	39.4	39.4	137.9
Lamar	222.7	...	...	...	...	74.2	68.5	5.7	74.2
Lawrence	203.3	...	...	...	...	41.9	131.6	12.0	17.9
Marion	211.4	...	...	11.1	...	38.9	77.9	27.8	55.6
Pearl River	340.1	...	6.2	...	6.2	92.8	68.0	6.2	160.8
Perry	351.5	151.5	...	...	...	78.8	30.3	6.1	84.8
Stone	228.4	56.0	...	12.9	...	64.6	21.5	4.3	68.9
Walthall	129.3	...	...	...	...	6.2	30.8	...	92.4
Wayne	428.4	105.6	...	...	...	129.1	17.6	...	176.1
All counties	4329.0	535.7	40.5	116.7	31.3	1063.3	769.7	212.4	1559.3

¹ Includes land leased to forest industry.

² Indian land will be classed as corporate or individual as defined by the Bureau of Indian Affairs.

Table 3—Area of timberland by county and forest type group, South Mississippi, 1987

County	Total	Forest type group							
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress	Elm-ash cottonwood
		Planted	Natural	Planted	Natural				
----- Thousand acres -----									
Covington	160.6	...	...	7.0	14.0	41.9	48.9	48.9	...
Forrest	218.3	14.9	19.8	19.8	29.8	74.4	29.8	29.8	...
George	222.6	24.7	6.2	12.4	30.9	49.5	49.5	49.5	...
Greene	382.9	70.5	15.1	30.2	25.2	110.8	70.5	60.5	...
Hancock	200.4	22.9	45.8	11.5	22.9	40.1	11.5	45.8	...
Harrison	253.5	10.1	91.3	10.1	5.1	81.1	15.2	40.6	...
Jackson	336.9	5.7	85.7	11.4	...	85.7	62.8	85.7	...
Jefferson Davis	143.1	...	...	22.0	27.5	22.0	55.0	11.0	5.5
Jones	295.5	13.1	19.7	6.6	59.1	85.4	72.2	39.4	...
Lamar	222.7	22.8	40.0	40.0	17.1	45.7	28.5	28.5	...
Lawrence	203.3	...	6.0	12.0	53.8	65.8	23.9	41.9	...
Marion	211.4	5.6	5.6	...	44.5	72.3	44.5	38.9	...
Pearl River	340.1	61.8	37.1	30.9	30.9	55.7	68.0	55.7	...
Perry	351.5	30.3	48.5	42.4	42.4	78.8	72.7	36.4	...
Stone	228.4	17.2	51.7	34.5	17.2	60.3	21.5	25.9	...
Walthall	129.3	...	...	6.2	24.6	12.3	55.4	30.8	...
Wayne	428.4	23.5	23.5	35.2	88.0	117.4	88.0	52.8	...
All counties	4329.0	323.3	495.9	332.1	533.1	1099.1	818.1	721.8	5.5

**Table 4—Area of timberland by county and stand-size class,
South Mississippi, 1987**

County	All classes	Stand-size class		Sapling- seedling	Nonstocked ¹ areas
		Sawtimber	Poletimber		
-----Thousand acres-----					
Covington	160.6	48.9	20.9	90.7	...
Forrest	218.3	94.3	54.6	69.5	...
George	222.6	68.0	74.2	74.2	6.2
Greene	382.9	151.1	146.1	85.6	...
Hancock	200.4	51.5	80.2	68.7	...
Harrison	253.5	91.3	45.6	111.6	5.1
Jackson	336.9	119.9	74.2	137.0	5.7
Jefferson Davis	143.1	27.5	44.0	66.1	5.5
Jones	295.5	190.4	46.0	59.1	...
Lamar	222.7	68.5	57.1	97.1	...
Lawrence	203.3	83.7	47.8	65.8	6.0
Marion	211.4	105.7	44.5	61.2	...
Pearl River	340.1	99.0	92.8	148.4	...
Perry	351.5	133.3	84.8	127.3	6.1
Stone	228.4	86.2	56.0	86.2	...
Walthall	129.3	49.3	18.5	61.6	...
Wayne	428.4	176.1	111.5	140.8	...
All counties	4329.0	1644.7	1098.9	1550.9	34.5

¹ Timberland less than 16.7 percent stocked.

**Table 5—Area of timberland by county and site class,
South Mississippi, 1987**

County	All classes	Site class (cubic feet/acre/year)				
		>165	120-165	85-120	50-85	<50
-----Thousand acres-----						
Covington	160.6	27.9	83.8	48.9	...	...
Forrest	218.3	59.5	39.7	79.4	39.7	...
George	222.6	6.2	43.3	98.9	74.2	...
Greene	382.9	45.3	90.7	191.4	55.4	...
Hancock	200.4	...	11.5	85.9	97.4	5.7
Harrison	253.5	5.1	40.6	126.8	60.8	20.3
Jackson	336.9	5.7	28.6	85.7	177.0	40.0
Jefferson Davis	143.1	5.5	22.0	77.1	38.5	...
Jones	295.5	85.4	131.3	78.8	...	...
Lamar	222.7	17.1	51.4	102.8	51.4	...
Lawrence	203.3	35.9	83.7	77.7	6.0	...
Marion	211.4	16.7	72.3	94.6	27.8	...
Pearl River	340.1	12.4	86.6	92.8	123.7	24.7
Perry	351.5	54.5	103.0	151.5	42.4	...
Stone	228.4	30.2	64.6	94.8	38.8	...
Walthall	129.3	...	30.8	92.4	6.2	...
Wayne	428.4	46.9	129.1	193.7	52.8	5.9
All counties	4329.0	454.4	1112.9	1773.0	892.1	96.6

Table 6—Area of timberland by county and stocking classes of growing-stock trees, South Mississippi, 1987

County	All classes	Stocking class (percent)				
		>130	100-130	60-100	16.7-60	<16.7
----- <i>Thousand acres</i> -----						
Covington	160.6	7.0	20.9	62.8	69.8	...
Forrest	218.3	5.0	29.8	143.9	39.7	...
George	222.6	...	12.4	154.6	49.5	6.2
Greene	382.9	5.0	65.5	216.6	95.7	...
Hancock	200.4	...	51.5	74.5	74.5	...
Harrison	253.5	5.1	15.2	187.6	40.6	5.1
Jackson	336.9	17.1	74.2	148.5	91.4	5.7
Jefferson Davis	143.1	16.5	22.0	60.5	38.5	5.5
Jones	295.5	13.1	52.5	170.7	59.1	...
Lamar	222.7	...	40.0	131.3	51.4	...
Lawrence	203.3	...	53.8	107.6	35.9	6.0
Marion	211.4	...	38.9	139.1	33.4	...
Pearl River	340.1	12.4	30.9	235.0	61.8	...
Perry	351.5	12.1	72.7	224.2	36.4	6.1
Stone	228.4	17.2	47.4	120.7	43.1	...
Walthall	129.3	...	18.5	37.0	73.9	...
Wayne	428.4	11.7	88.0	258.2	70.4	...
All counties	4329.0	122.3	734.4	2472.8	965.0	34.5

Table 7—Area of timberland by forest type and ownership class, South Mississippi, 1987

Forest type ¹	All ownerships	National forest	Other public	Forest industry	Forest industry- leased	Other private
----- <i>Thousand acres</i> -----						
Longleaf-slash pine	819.2	186.5	47.1	244.8	4.3	336.5
Loblolly-shortleaf pine	865.3	61.6	23.7	300.2	10.5	469.3
Softwood total	1684.4	248.1	70.8	544.9	14.8	805.8
Oak-pine	1099.1	188.2	57.8	196.1	4.3	652.7
Oak-hickory	818.1	63.8	24.3	147.1	...	582.9
Oak-gum-cypress	721.8	35.5	35.7	156.1	...	494.5
Elm-ash-cottonwood	5.5	...	...	...	...	5.5
Hardwood total	2644.5	287.6	117.8	499.3	4.3	1735.5
All types	4329.0	535.7	188.5	1044.2	19.1	2541.3

¹ Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

Table 8—Area of timberland by ownership and stocking classes of growing-stock trees, South Mississippi, 1987

Ownership class	All classes	Stocking class (percent)				
		>130	100-130	60-100	16.7-60	<16.7
----- <i>Thousand acres</i> -----						
National forest	535.7	12.4	104.4	345.0	67.8	6.1
Other public	188.5	5.7	22.0	97.7	63.2	...
Forest industry	1044.2	81.7	263.8	548.6	144.3	5.7
Forest industry-leased	19.1	...	4.3	14.8	...	...
Other private	2541.3	22.4	339.8	1466.7	689.6	22.7
All ownerships	4329.0	122.3	734.4	2472.8	965.0	34.5

Table 9—Area of timberland by forest type and stand-size class, South Mississippi, 1987

Forest type ¹	All classes	Stand-size class			Nonstocked ² areas
		Sawtimber	Poletimber	Sapling- seedling	
----- <i>Thousand acres</i> -----					
Longleaf-slash pine	819.2	324.8	204.1	284.2	6.1
Loblolly-shortleaf pine	865.3	326.9	243.1	295.3	...
Softwood total	1684.4	651.7	447.2	579.5	6.1
Oak-pine	1099.1	427.8	256.0	415.3	...
Oak-hickory	818.1	190.9	163.4	457.6	6.2
Oak-gum-cypress	721.8	374.3	232.4	98.4	16.8
Elm-ash-cottonwood	5.5	...	...	...	5.5
Hardwood total	2644.5	993.0	651.7	971.4	28.4
All types	4329.0	1644.7	1098.9	1550.9	34.5

¹ Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood type.

² Timberland less than 16.7 percent stocked.

Table 10--Number of live trees on timberland by species and diameter class, South Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----													
Longleaf-slash pines	335511	125077	88681	54191	28722	16689	10830	6136	3223	1406	409	146	...
Shortleaf-loblolly pine	431259	194998	120784	47298	30522	14820	10033	6045	3589	1673	732	746	19
Other yellow pines	4607	1092	567	771	648	448	452	216	104	115	112	82	...
Cypress	33880	17733	11351	2679	1160	298	271	82	96	94	43	72	...
Other softwoods	1851	1659	...	...	112	...	60	19	...	...	...	...	...
Total softwoods	807108	340559	221383	104940	61164	32255	21648	12499	7012	3288	1297	1046	19
Select white oaks	33690	19829	5745	3235	1448	965	796	610	338	287	169	249	20
Select red oaks	4103	1558	1512	86	344	87	102	97	80	51	50	109	27
Other white oaks	66990	44119	10414	5483	2955	1665	924	675	437	93	126	89	9
Other red oaks	338334	241615	46058	20807	10733	7530	4485	2738	1544	1170	598	918	137
Hickory	28435	21721	1574	2009	942	689	498	452	243	133	115	53	8
Hard maple	93	...	...	93	...	...	...	...	...	...	...	...	...
Soft maple	201902	163877	21567	10355	3678	1233	606	306	116	98	53	13	...
Beech	2972	1615	548	...	65	158	145	66	110	85	79	88	13
Sweetgum	170968	118096	29087	11415	6051	3076	1252	741	506	321	172	226	25
Tupelo-blackgum	273628	166458	52443	22334	12950	7600	4783	3762	1681	917	311	339	50
Ash	17121	10441	3790	1827	397	279	108	83	118	11	39	27	...
Yellow-poplar	40961	23735	6290	3348	2530	1576	1550	916	478	269	93	155	21
Black walnut	82	...	...	...	82	...	...	...	...	...	...	...	...
Other hardwoods	487356	352027	81682	27944	12548	5814	3450	1638	1272	462	339	167	13
Total hardwoods	1666634	1165090	260711	108935	54723	30671	18699	12083	6924	3897	2144	2434	324
Noncommercial	236038	196705	20564	12492	4072	1820	177	100	64	14	19	8	3
All species	2709781	1702354	502658	226367	119959	64746	40523	24681	14000	7199	3460	3488	346

Table 11—Number of growing-stock trees on timberland by species and diameter class, South Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----													
Longleaf-slash pines	297886	105307	75913	51113	27912	15886	10689	5960	3213	1383	372	139	...
Shortleaf-loblolly pine	352357	146988	98362	42559	28647	13946	9512	5864	3438	1620	680	722	19
Other yellow pines	3861	567	567	608	590	448	452	216	104	115	112	82	...
Cypress	28929	15112	9374	2539	1106	219	228	82	81	83	32	72	...
Other softwoods	1818	1659	...	...	112	...	27	19	...	...	...	...	...
Total softwoods	684850	269633	184216	96819	58367	30498	20909	12141	6836	3200	1196	1015	19
Select white oaks	14934	5787	2590	2646	1076	840	685	542	183	252	130	186	17
Select red oaks	2382	...	1512	...	344	87	76	97	65	51	50	81	20
Other white oaks	25791	9825	6049	4377	2626	1397	566	462	250	64	82	82	9
Other red oaks	141068	75173	26134	15776	9198	6586	2983	2092	1236	763	488	576	62
Hickory	10877	5319	1574	1368	870	646	353	364	209	109	22	39	4
Hard maple	93	...	...	93	...	...	...	...	...	...	...	...	...
Soft maple	47005	28953	9482	5430	1846	710	336	137	36	54	20	...	...
Beech	430	...	...	...	65	113	58	24	80	13	41	33	4
Sweetgum	76717	41718	15564	8764	5417	2683	887	612	473	256	151	178	16
Tupelo-blackgum	109536	38938	28365	15995	10848	6574	3391	3085	1284	722	193	135	7
Ash	6815	3121	1571	1283	329	201	77	64	101	11	29	27	...
Yellow-poplar	27177	13388	4944	2547	2323	1337	1117	791	316	220	61	128	5
Black walnut	82	...	...	...	82	...	...	...	...	...	...	...	...
Other hardwoods	144224	93003	21192	14449	8267	3729	1953	727	526	189	119	67	4
Total hardwoods	607133	315226	118977	72729	43293	24902	12482	8996	4759	2703	1386	1531	148
All species	1291983	584859	303193	169548	101660	55400	33391	21137	11595	5903	2582	2546	167

Table 12—Volume of growing stock on timberland by species and diameter class, South Mississippi, 1987

Species	Diameter class (inches at breast height)										
	All classes	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Million cubic feet-----											
Longleaf-slash pines	1177.5	128.7	180.1	206.8	229.3	186.6	135.5	73.9	24.4	12.2	...
Shortleaf-loblolly pine	1179.1	105.8	182.9	175.3	191.8	171.3	141.2	85.8	46.6	75.0	3.4
Other yellow pines	52.9	2.0	3.8	5.8	8.1	5.9	4.9	6.9	7.5	7.9	...
Cypress	31.7	4.8	6.0	2.1	3.0	1.6	2.5	4.0	1.4	6.2	...
Other softwoods	1.5	...	0.6	...	0.4	0.5	...	...	...	...	...
Total softwoods	2442.7	241.4	373.4	390.0	432.8	365.9	284.1	170.6	79.9	101.3	3.4
Select white oaks	88.9	7.3	6.0	9.7	12.1	13.5	6.4	10.7	6.8	13.4	3.0
Select red oaks	26.5	...	1.6	0.8	1.5	2.8	2.3	2.8	3.0	7.8	4.0
Other white oaks	72.5	9.3	12.9	11.8	8.9	9.5	6.7	2.3	4.0	5.6	1.6
Other red oaks	405.9	42.5	53.7	64.5	48.9	49.2	39.2	31.5	26.2	42.5	7.9
Hickory	41.7	2.4	3.9	5.7	5.4	8.2	7.5	4.3	1.3	2.8	0.2
Hard maple	0.4	0.4	...	...	...	...	...	...	...	...	...
Soft maple	42.7	14.4	10.4	6.2	5.4	2.7	0.8	2.0	0.8	...	...
Beech	10.8	...	0.4	1.4	0.6	0.4	2.6	0.6	1.9	2.6	0.5
Sweetgum	173.1	20.3	31.9	28.9	16.4	16.7	17.5	12.5	10.0	16.3	2.5
Tupelo-blackgum	395.9	37.2	62.1	70.2	57.6	74.7	43.2	31.1	10.3	8.7	0.7
Ash	18.6	3.6	2.1	2.3	1.4	1.5	3.5	0.5	1.8	2.0	...
Yellow-poplar	109.6	7.5	14.4	14.4	19.0	19.7	11.4	9.7	3.3	9.3	0.8
Black walnut	0.2	...	0.2	...	...	...	...	...	...	...	...
Other hardwoods	213.4	39.0	50.9	39.6	32.8	16.8	16.7	7.1	5.8	4.4	0.3
Total hardwoods	1600.2	183.8	250.6	255.3	209.9	215.7	157.7	115.2	75.1	115.5	21.4
All species	4042.9	425.2	624.0	645.4	642.7	581.6	441.8	285.8	155.0	216.7	24.8

Table 13—Volume of growing stock in the saw-log portion of sawtimber¹ trees on timberland by species and diameter class, South Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)							
		9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million cubic feet -----									
Longleaf-slash pines	754.3	161.4	202.7	169.5	121.8	65.7	22.3	11.0	...
Shortleaf-loblolly pine	780.7	140.9	169.5	153.8	127.2	76.5	42.4	67.4	3.0
Other yellow pines	42.5	5.0	7.1	5.3	4.6	6.4	6.6	7.6	...
Cypress	19.0	1.7	2.4	1.5	2.3	3.9	1.3	6.1	...
Other softwoods	0.8	...	0.4	0.4	...	...	...	...	...
Total softwoods	1597.3	309.0	382.0	330.5	255.9	152.4	72.5	92.0	3.0
Select white oaks	55.5	...	9.0	11.3	5.5	9.4	5.8	12.1	2.5
Select red oaks	22.3	...	1.1	2.5	2.2	2.5	2.8	7.3	3.9
Other white oaks	32.9	...	7.0	8.0	6.0	1.9	3.4	4.9	1.6
Other red oaks	208.0	...	35.1	41.3	34.8	27.5	23.7	38.3	7.3
Hickory	24.5	...	4.0	6.9	6.0	3.7	1.1	2.6	0.2
Soft maple	9.5	...	4.0	2.4	0.7	1.6	0.8	...	...
Beech	8.0	...	0.6	0.3	2.0	0.6	1.6	2.5	0.5
Sweetgum	77.8	...	11.1	14.1	15.2	11.4	8.8	15.1	2.1
Tupelo-blackgum	193.8	...	43.1	64.2	39.7	28.2	9.9	8.2	0.6
Ash	9.2	...	1.2	1.0	3.2	0.5	1.6	1.7	...
Yellow-poplar	60.6	...	13.3	16.8	10.1	8.8	2.9	8.1	0.7
Other hardwoods	69.0	...	24.3	14.0	14.4	6.6	5.4	4.0	0.3
Total hardwoods	771.0	...	153.7	182.7	139.6	102.7	67.7	104.9	19.6
All species	2368.3	309.0	535.8	513.2	395.5	255.1	140.2	196.9	22.6

¹ That part of the bole of sawtimber trees between the 1-foot stump and the saw-log top, including the portion of the forks large enough to contain a saw log.

Table 14—Volume of sawtimber on timberland by species and diameter class, South Mississippi, 1987

Species	Diameter class (inches at breast height)								
	All classes	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Million board feet-----									
Longleaf-slash pines	4548.0	866.8	1198.7	1056.8	783.3	424.3	144.8	73.3	...
Shortleaf-loblolly pine	4763.5	759.7	992.2	940.0	808.3	497.7	282.1	462.5	20.9
Other yellow pines	261.5	27.7	39.1	30.7	29.7	41.0	43.6	49.8	...
Cypress	101.8	8.2	11.2	7.9	12.0	22.0	6.9	33.7	...
Other softwoods	4.2	...	1.8	2.3	...	...	...	...	...
Total softwoods	9679.0	1662.4	2243.0	2037.7	1633.3	984.9	477.3	619.4	20.9
Select white oaks	343.2	...	49.4	65.3	31.2	61.3	37.8	80.2	18.1
Select red oaks	141.3	...	6.5	13.4	13.6	15.7	17.8	48.6	25.8
Other white oaks	197.2	...	38.5	46.1	37.4	12.1	20.9	32.4	10.0
Other red oaks	1235.2	...	189.9	236.8	205.1	165.5	148.0	241.1	48.8
Hickory	153.2	...	22.2	41.8	37.5	24.5	7.1	18.2	1.9
Soft maple	53.3	...	21.7	13.2	4.2	9.9	4.3	...	...
Beech	53.4	...	3.2	1.8	13.0	3.9	10.3	18.1	3.2
Sweetgum	466.8	...	61.3	81.3	92.1	70.1	54.7	93.6	13.6
Tupelo-blackgum	1050.6	...	221.5	341.6	221.4	160.2	55.2	47.4	3.2
Ash	55.2	...	6.3	5.6	19.7	3.3	10.6	9.7	...
Yellow-poplar	348.2	...	72.2	95.5	57.8	52.2	17.6	48.5	4.4
Other hardwoods	400.5	...	134.7	81.0	83.9	40.3	32.4	25.5	2.5
Total hardwoods	4498.1	...	827.4	1023.5	816.8	619.0	416.6	663.2	131.5
All species	14177.0	1662.4	3070.4	3061.2	2450.1	1604.0	893.9	1282.6	152.4

Table 15—Volume of growing stock and sawtimber on timberland by county and species group, South Mississippi, 1987

County	Growing stock						Sawtimber					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine	Other	Soft ¹	Hard ²	Pine		Other	Soft ¹	Hard ²		
											Planted	Natural	Planted	Natural
-----Million cubic feet-----						-----Million board feet-----						
Covington	149.8	0.5	39.4	3.2	43.6	63.2	598.4	2.4	196.9	13.4	138.0	247.7
Forrest	232.7	37.9	125.8	...	35.8	33.2	820.0	144.8	477.6	...	92.3	105.4
George	191.2	23.8	71.4	6.4	56.7	32.9	593.2	22.6	267.9	33.0	153.4	116.3
Greene	384.9	97.1	138.8	0.3	61.0	87.8	1216.5	232.5	619.7	...	118.0	246.3
Hancock	134.9	29.1	67.0	3.2	25.2	10.5	397.8	76.2	223.7	2.4	69.3	26.2
Harrison	203.4	4.5	153.9	2.6	31.6	10.7	703.9	6.9	604.4	6.0	61.7	24.9
Jackson	311.6	12.0	117.7	14.0	128.4	39.5	972.5	27.6	458.2	37.3	307.3	142.2
Jefferson Davis	88.2	2.1	45.8	...	25.2	15.1	295.4	...	180.6	...	75.1	39.8
Jones	356.3	21.3	210.1	...	53.3	71.6	1369.0	92.1	920.1	...	138.5	218.3
Lamar	179.8	32.3	75.6	...	52.8	19.2	534.5	43.3	306.1	...	141.5	43.6
Lawrence	230.3	0.3	132.3	...	34.2	63.5	915.4	...	563.1	...	88.2	264.1
Marion	244.4	2.3	132.7	...	45.4	64.0	900.5	...	582.0	...	109.5	209.1
Pearl River	236.6	51.8	83.2	...	68.4	33.2	739.6	104.9	355.2	...	189.9	89.6
Perry	388.6	55.0	207.2	0.9	75.4	50.1	1432.0	116.5	1009.0	6.0	215.6	84.9
Stone	205.8	30.5	120.3	1.3	34.9	18.9	758.9	81.8	575.1	0.8	44.5	56.7
Walthall	97.4	...	31.3	0.9	45.1	20.2	368.1	...	143.8	5.2	149.6	69.5
Wayne	406.8	36.7	219.9	0.4	63.7	86.1	1561.3	174.1	964.1	1.8	162.3	258.8
All counties	4042.9	437.2	1972.3	33.2	880.5	719.7	14177.0	1125.6	8447.4	106.0	2254.6	2243.5

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

**Table 16—Volume of timber on timberland by class of timber and species group,
South Mississippi, 1987**

Class of timber	All species	Softwood			Hardwood	
		Pine			Soft ¹	Hard ²
		Planted	Natural	Other		
----- Million cubic feet -----						
Sawtimber trees:						
Saw-log portion	2368.3	193.8	1383.7	19.8	399.0	372.0
Upper-stem portion	370.1	34.6	194.1	2.0	74.0	65.5
Total	2738.4	228.4	1577.8	21.8	473.0	437.4
Poletimber trees	1304.5	208.7	394.6	11.4	407.5	282.3
All growing-stock trees	4042.9	437.2	1972.3	33.2	880.5	719.7
Rough trees:						
Sawtimber size	281.6	3.9	43.2	1.3	110.9	122.2
Poletimber size	221.9	10.4	17.0	0.3	78.5	115.7
Total	503.4	14.3	60.3	1.5	189.4	237.9
Rotten trees:						
Sawtimber size	57.9	...	0.9	1.3	35.6	20.1
Poletimber size	4.1	...	...	...	3.2	1.0
Total	62.0	...	0.9	1.3	38.7	21.0
Salvable dead trees:						
Sawtimber size	27.9	1.7	20.0	0.3	2.5	3.5
Poletimber size	12.9	2.1	7.7	...	0.6	2.5
Total	40.8	3.8	27.6	0.3	3.1	6.0
All classes	4649.1	455.2	2061.2	36.4	1111.7	984.7

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 17—Volume of live trees and growing stock on timberland by ownership class and species group,
South Mississippi, 1987

Ownership class	Live trees						Growing stock					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine			Soft ¹	Hard ²		Pine			Soft ¹	Hard ²
		Planted	Natural	Other				Planted	Natural	Other		
-----Million cubic feet-----												
National forest	776.2	68.1	463.2	2.2	126.4	116.3	715.1	68.1	456.2	1.6	103.1	86.1
Other public	221.7	6.4	104.8	10.2	54.6	45.6	196.2	6.4	103.5	9.9	41.9	34.4
Forest industry	945.1	252.6	267.6	6.6	243.2	175.1	834.8	242.7	258.0	6.1	195.0	133.0
Forest industry-leased	25.4	2.0	17.2	...	5.5	0.8	22.7	1.6	16.1	...	4.7	0.3
Other private	2639.8	122.3	1180.7	17.1	678.9	640.9	2274.0	118.4	1138.5	15.6	535.7	465.9
All ownerships	4608.3	451.5	2033.5	36.1	1108.6	978.7	4042.9	437.2	1972.3	33.2	880.5	719.7

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 18—Average net annual growth of growing stock and sawtimber on timberland by county and species group,
South Mississippi, 1987

County	Growing stock						Sawtimber							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard ²
-----Million cubic feet-----						-----Million board feet-----								
Covington	5.3	...	2.1	0.1	1.3	1.8	19.1	...	11.3	0.4	2.8	4.6		
Forrest	12.1	1.7	7.2	...	1.5	1.7	49.7	5.0	34.6	...	3.3	6.9		
George	8.6	2.9	3.5	...	1.6	0.6	24.2	2.6	15.1	...	6.0	0.4		
Greene	20.2	3.8	8.9	...	2.4	5.0	74.9	12.8	43.8	0.1	3.9	14.6		
Hancock	6.9	1.2	4.7	0.1	0.5	0.4	26.6	3.7	20.2	...	1.5	1.1		
Harrison	8.9	2.1	4.8	0.1	1.3	0.5	30.0	5.3	21.2	0.5	1.9	1.1		
Jackson	7.9	0.8	4.3	0.2	1.7	0.9	31.2	1.6	22.4	0.1	3.9	3.4		
Jefferson Davis	7.6	2.6	3.9	...	0.9	0.2	30.6	14.8	9.8	...	3.9	2.1		
Jones	16.6	1.0	8.8	...	2.8	4.0	65.1	2.1	46.1	...	6.6	10.3		
Lamar	11.4	2.2	6.0	...	2.1	1.1	33.4	2.0	23.1	...	6.5	1.8		
Lawrence	13.7	0.9	8.9	...	0.9	3.0	62.1	4.3	41.6	...	2.3	13.9		
Marion	14.4	2.0	7.2	...	1.9	3.2	56.5	7.1	33.6	...	3.2	12.6		
Pearl River	17.0	5.1	6.3	...	3.0	2.6	55.3	12.1	26.0	...	9.9	7.3		
Perry	19.4	5.6	8.3	...	2.7	2.7	70.3	15.1	42.1	...	7.5	5.7		
Stone	9.4	1.5	5.8	0.1	1.5	0.7	35.0	3.9	26.0	...	1.7	3.4		
Walthall	6.6	...	3.9	...	1.7	1.0	26.0	...	14.9	...	5.8	5.3		
Wayne	21.1	2.0	12.5	...	2.9	3.6	88.4	4.3	62.4	...	6.3	15.3		
All counties	207.0	35.4	107.3	0.5	30.8	33.0	778.5	96.7	494.2	0.8	77.0	109.8		

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 19—Average annual removals of growing stock and sawtimber on timberland by county and species group,
South Mississippi, 1987

County	Growing stock						Sawtimber							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard ²
-----Million cubic feet-----														
Covington	9.8	...	5.3	...	1.6	3.0	33.8	...	21.9	...	4.2	7.7		
Forrest	6.2	0.4	5.7	...	...	0.1	27.3	1.0	26.3	...	...	...		
George	15.0	1.9	11.2	1.2	0.2	0.5	55.4	2.8	46.4	5.0	0.6	0.4		
Greene	11.7	1.2	8.0	...	1.4	1.0	43.5	2.3	32.8	...	4.7	3.7		
Hancock	2.1	0.3	1.7	...	0.1	...	6.2	0.6	5.6	...	...	...		
Harrison	6.3	1.2	5.0	...	0.1	...	24.1	3.0	20.9	...	0.2	...		
Jackson	10.5	1.2	7.0	...	1.3	1.0	46.7	2.4	33.8	...	7.0	3.5		
Jefferson Davis	8.6	2.2	6.0	...	0.2	0.2	19.4	2.4	16.4	...	0.3	0.3		
Jones	17.8	0.7	12.5	...	2.7	1.9	86.4	3.1	69.5	...	8.2	5.6		
Lamar	4.5	1.2	3.0	...	...	0.3	10.2	...	9.6	...	...	0.6		
Lawrence	13.4	1.1	9.7	...	0.8	1.8	40.1	2.3	29.5	...	2.5	5.7		
Marion	5.8	...	2.4	...	1.2	2.2	21.5	...	7.8	...	4.5	9.2		
Pearl River	9.3	2.6	5.3	0.1	1.1	0.3	26.8	8.1	13.7	0.3	3.8	0.9		
Perry	18.2	1.7	13.7	...	0.9	1.9	73.3	5.2	60.5	...	2.7	4.9		
Stone	8.3	0.6	6.6	...	0.8	0.3	28.0	0.7	24.1	...	2.3	0.9		
Walthall	7.4	...	6.4	...	0.2	0.7	28.3	...	24.2	...	0.4	3.7		
Wayne	22.8	0.5	15.0	...	2.4	5.0	84.2	0.8	63.4	...	2.8	17.2		
All counties	177.8	16.9	124.4	1.3	15.0	20.1	655.2	34.8	506.4	5.3	44.3	64.4		

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottownwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 20—Average net annual growth and average annual removals of growing stock on timberland by species, South Mississippi, 1987

Species	Growth	Removals
- - - - Million cubic feet - - - -		
Yellow pines	142.6	141.4
Other softwoods	0.5	1.3
Total softwoods	143.2	142.7
Select white-red oaks	5.7	4.2
Other white-red oaks	23.2	13.0
Hickory	1.2	1.5
Hard maple	...	...
Sweetgum	6.9	4.9
Ash-walnut-black cherry	1.0	0.4
Yellow-poplar	6.7	2.7
Other hardwoods	19.0	8.4
Total hardwoods	63.8	35.1
All species	207.0	177.8

Table 21—Average net annual growth and average annual removals of sawtimber on timberland by species, South Mississippi, 1987

Species	Growth	Removals
- - - - Million board feet - - - -		
Yellow pines	590.9	541.2
Other softwoods	0.8	5.3
Total softwoods	591.7	546.6
Select white-red oaks	26.0	16.7
Other white-red oaks	75.9	41.4
Hickory	3.2	4.8
Sweetgum	14.1	11.7
Ash-walnut-black cherry	0.9	1.2
Yellow-poplar	23.8	11.5
Other hardwoods	43.0	21.4
Total hardwoods	186.8	108.7
All species	778.5	655.2

Table 22—Average annual mortality of growing stock and sawtimber on timberland by species, South Mississippi, 1987

Species	Growing stock	Sawtimber
- - Million cubic feet - - Million board feet - -		
Yellow pines	25.0	83.8
Other softwoods	0.9	1.2
Total softwoods	25.9	84.9
Select white-red oaks	0.6	2.3
Other white-red oaks	5.3	14.7
Hickory	0.5	2.5
Sweetgum	2.4	7.0
Ash-walnut-black cherry	0.5	2.1
Yellow-poplar	0.3	1.2
Other hardwoods	5.3	13.0
Total hardwoods	15.0	42.8
All species	40.9	127.7

Table 23—Average net annual growth and average annual removals of growing stock on timberland by ownership class and species group, South Mississippi, 1987

Ownership class	Growth						Removals					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 24—Average net annual growth and average annual removals of sawtimber on timberland by ownership class and species, South Mississippi, 1987

Ownership class	Growth						Removals					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine			Soft ¹	Hard ²		Pine			Soft ¹	Hard ²
		Planted	Natural	Other				Planted	Natural	Other		
----- Million board feet -----												
National forest	116.2	10.9	83.4	...	10.3	11.6	85.3	0.6	79.4	...	0.5	4.7
Other public	26.3	0.2	20.7	0.1	2.6	2.8	20.5	0.4	17.2	0.3	1.5	1.1
Forest industry	179.3	49.9	94.6	0.4	16.9	17.4	206.9	29.0	145.3	...	14.6	17.9
Forest industry-leased	1.7	...	1.6	...	0.1	...	...	...	...	...	...	...
Other private	455.0	35.7	293.8	0.3	47.2	78.0	342.5	4.8	264.4	5.0	27.7	40.6
All ownerships	778.5	96.7	494.2	0.8	77.0	109.8	655.2	34.8	506.4	5.3	44.3	64.4

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

**Table 25—Volume of sawtimber on timberland by species and tree grade,
South Mississippi, 1987**

Species	All grades	Grade 1	Grade 2	Grade 3	Grade 4
----- Million board feet -----					
Yellow pines	9573.0	1635.9	1786.8	6150.3	...
Cypress	101.8	44.2	28.7	28.9	...
Redcedar	1.8	1.8	...	...	...
Other softwoods	2.3	2.3	...	...	...
Total softwoods	9679.0	1684.2	1815.5	6179.2	...
Select white-red oaks	484.6	67.5	77.1	185.6	154.4
Other white-red oaks	1432.4	21.1	67.2	255.2	1088.9
Hickory	153.2	3.9	24.4	76.2	48.7
Sweetgum	466.8	97.6	87.5	170.7	111.0
Tupelo and blackgum	1050.6	84.2	340.0	512.9	113.5
Ash-walnut-black cherry	60.0	16.3	18.2	20.0	5.6
Yellow-poplar	348.2	9.4	28.2	135.9	174.6
Other hardwoods	502.4	14.5	24.9	138.1	324.9
Total hardwoods	4498.1	314.4	667.6	1494.6	2021.5
All species	14177.0	1998.7	2483.1	7673.8	2021.5

Supplemental Tables 26–36

**Table 26—Area of timberland by stand age, forest type group and type of regeneration,
South Mississippi, 1987**

Stand age class	Pine		Oak-pine		Other hardwood types	
	Artificial	Natural	Artificial	Natural	Artificial	Natural
----- Thousand acres -----						
1-10	293.1	93.4	121.5	42.4	106.2	61.7
11-20	168.2	56.4	26.2	53.5	6.2	159.9
21-30	64.7	31.7	5.0	...	...	5.7
31-40	16.5	32.8	...	10.0	6.1	...
41-50	12.4	18.8	...	14.4	...	...
>50	...	20.4	5.0	5.9	...	...
Mixed	100.5	775.6	67.8	747.4	38.6	1161.0
Total	655.4	1029.0	225.4	873.7	157.1	1388.4

Table 27—Volume of softwood growing stock on timberland by forest type, South Mississippi, 1987

County	Total	Forest type group						
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum cypress
		Planted	Natural	Planted	Natural			
----- Million cubic feet -----								
Covington	43.1	...	...	...	1.0	32.6	3.3	6.3
Forrest	163.7	16.8	43.9	8.5	34.2	53.6	1.9	4.7
George	101.6	21.2	3.4	...	39.3	16.6	11.1	10.0
Greene	236.2	58.2	26.1	33.0	31.8	71.8	6.3	9.0
Hancock	99.2	24.5	22.2	2.5	22.6	18.4	...	9.0
Harrison	161.0	1.4	89.0	3.1	...	54.9	2.7	9.9
Jackson	143.7	9.1	66.8	3.0	...	43.8	11.4	9.7
Jefferson Davis	47.9	...	...	2.1	33.8	6.5	5.0	0.6
Jones	231.4	20.5	38.0	0.8	74.9	75.3	12.0	9.9
Lamar	107.8	4.7	36.6	22.8	15.0	17.1	7.4	4.1
Lawrence	132.6	...	10.4	0.3	63.9	45.0	3.7	9.4
Marion	135.0	1.8	3.6	...	54.9	55.3	9.6	9.8
Pearl River	135.0	26.4	21.5	22.5	37.1	8.3	13.4	5.7
Perry	263.1	20.5	73.3	29.9	60.1	60.2	13.3	5.8
Stone	152.0	13.8	61.3	6.9	27.6	26.5	9.1	6.9
Walthall	32.1	...	...	...	16.4	0.2	6.4	9.2
Wayne	257.0	21.5	28.6	11.1	98.8	71.3	15.5	10.2
All counties	2442.7	240.4	524.8	146.5	611.4	657.4	131.9	130.2

Table 28—Volume of hardwood growing stock on timberland by forest type, South Mississippi, 1987

County	Total	Forest type group						
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum cypress
		Planted	Natural	Planted	Natural			
----- Million cubic feet -----								
Covington	106.8	...	...	...	1.6	24.8	17.2	63.1
Forrest	69.1	...	1.1	1.2	6.4	17.5	6.4	36.4
George	89.6	1.0	...	...	3.0	5.8	18.8	60.9
Greene	148.8	3.2	4.5	2.2	3.5	47.2	28.3	60.0
Hancock	35.7	...	0.4	...	2.3	5.6	...	27.4
Harrison	42.3	...	1.5	...	...	13.5	4.6	22.7
Jackson	167.9	...	9.5	...	...	10.8	17.0	130.6
Jefferson Davis	40.3	...	...	...	0.7	2.3	9.9	27.4
Jones	124.9	0.8	1.6	0.3	18.9	40.1	25.9	37.4
Lamar	72.0	...	2.0	2.1	2.2	10.0	23.7	32.0
Lawrence	97.7	...	...	...	8.6	31.1	3.4	54.6
Marion	109.4	...	0.2	...	8.2	31.3	26.7	43.0
Pearl River	101.6	3.2	1.3	0.4	5.2	7.7	20.0	63.9
Perry	125.5	...	5.9	1.8	9.6	40.7	24.7	42.8
Stone	53.8	...	4.5	1.0	2.1	14.4	13.8	18.0
Walthall	65.3	...	...	...	1.3	1.0	18.3	44.7
Wayne	149.8	1.0	3.9	2.0	17.2	33.2	41.4	51.2
All counties	1600.2	9.2	36.4	10.9	90.8	337.0	299.9	816.1

Table 29—Volume of softwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, South Mississippi, 1987

County	Total	Forest type group						
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum cypress
		Planted	Natural	Planted	Natural			
----- Million cubic feet -----								
Covington	34.2	...	...	...	...	26.9	1.7	5.5
Forrest	103.6	12.1	26.4	3.4	20.3	36.6	1.3	3.6
George	54.5	3.7	1.9	...	24.1	6.7	9.3	8.9
Greene	144.3	27.0	20.0	14.4	22.1	49.8	3.7	7.3
Hancock	53.2	11.8	8.0	0.9	13.4	13.2	...	5.9
Harrison	103.3	0.7	52.6	0.7	...	39.8	2.3	7.2
Jackson	89.6	4.5	44.1	0.6	...	26.0	7.4	7.1
Jefferson Davis	30.8	...	...	...	23.0	3.4	3.8	0.5
Jones	166.2	13.8	29.5	0.4	48.5	57.3	8.1	8.4
Lamar	58.5	0.3	24.3	6.7	9.7	9.1	4.6	3.7
Lawrence	91.1	...	1.1	...	44.2	36.0	1.1	8.7
Marion	94.9	...	2.2	...	34.9	41.2	8.2	8.4
Pearl River	77.3	6.2	13.6	12.6	26.4	3.3	9.9	5.2
Perry	183.8	6.2	60.7	12.6	41.3	48.1	9.7	5.2
Stone	108.1	5.5	49.9	2.0	20.8	18.3	7.0	4.5
Walthall	23.7	...	...	...	10.6	...	5.0	8.0
Wayne	180.6	16.7	20.5	7.0	62.4	53.4	11.6	9.1
All counties	1597.3	108.4	354.8	61.1	401.8	469.3	94.6	107.2

Table 30—Volume of hardwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, South Mississippi, 1987

County	Total	Forest type group						
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum cypress
		Planted	Natural	Planted	Natural			
----- Million cubic feet -----								
Covington	64.5	...	...	...	0.8	10.5	9.6	43.6
Forrest	34.1	...	...	0.6	3.1	5.7	4.7	19.9
George	46.6	0.4	...	...	0.5	2.7	12.4	30.7
Greene	61.6	0.5	0.8	0.4	1.6	16.9	8.4	33.0
Hancock	16.0	...	...	...	0.3	1.6	...	14.1
Harrison	15.5	...	0.3	...	...	4.0	0.7	10.6
Jackson	81.2	...	1.6	...	...	4.4	10.7	64.5
Jefferson Davis	19.5	...	...	...	0.2	0.2	3.0	16.1
Jones	61.4	...	...	...	8.8	17.8	12.4	22.4
Lamar	33.0	...	0.8	0.7	1.5	3.0	9.3	17.6
Lawrence	56.8	...	...	...	3.7	16.6	...	36.6
Marion	53.3	...	...	...	2.1	14.4	11.9	24.9
Pearl River	49.8	2.0	0.9	...	2.8	3.6	8.8	31.6
Perry	54.4	...	1.7	0.4	1.7	15.0	9.9	25.8
Stone	17.8	...	1.0	0.6	0.4	6.1	5.5	4.1
Walthall	36.1	...	...	...	...	0.4	6.2	29.4
Wayne	69.4	...	0.4	0.4	3.9	14.5	19.4	30.7
All counties	771.0	2.9	7.6	3.2	31.4	137.4	132.9	455.5

Table 31—Volume of timber on timberland by county, class of timber and species group,
South Mississippi, 1987

County	All classes	Growing stock		Rough		Rotten	
		Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
-----Million cubic feet-----							
Covington	176.6	43.1	106.8	0.5	22.3	...	4.0
Forrest	250.2	163.7	69.1	4.3	9.3	0.5	3.3
George	221.3	101.6	89.6	1.2	26.2	...	2.7
Greene	428.9	236.2	148.8	7.0	32.0	...	5.0
Hancock	157.4	99.2	35.7	3.8	12.9	0.9	5.0
Harrison	240.0	161.0	42.3	7.8	24.9	0.2	3.7
Jackson	355.1	143.7	167.9	1.4	37.4	0.3	4.4
Jefferson Davis	106.1	47.9	40.3	1.1	15.4	...	1.5
Jones	410.5	231.4	124.9	9.3	41.0	...	3.9
Lamar	220.0	107.8	72.0	8.5	30.2	...	1.5
Lawrence	270.3	132.6	97.7	6.2	28.0	...	5.8
Marion	270.0	135.0	109.4	2.0	20.8	...	2.8
Pearl River	275.0	135.0	101.6	4.7	29.9	...	3.8
Perry	424.7	263.1	125.5	7.1	25.6	...	3.4
Stone	228.0	152.0	53.8	3.8	17.5	...	0.9
Walthall	129.8	32.1	65.3	3.3	25.3	0.4	3.4
Wayne	444.4	257.0	149.8	4.1	28.6	...	4.8
All counties	4608.3	2442.7	1600.2	76.1	427.3	2.2	59.8

Table 32—Number of live trees on timberland by detailed species and diameter class, South Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----													
Longleaf pine	101844	37846	24989	12999	7636	6251	5676	3532	1783	871	174	87	...
Slash pine	233667	87231	63693	41192	21086	10437	5154	2605	1440	534	235	59	...
Shortleaf pine	57290	19615	15666	9317	5624	3060	2338	1117	313	187	31	22	...
Loblolly pine	373969	175382	105118	37981	24897	11760	7695	4929	3276	1486	702	724	19
Spruce pine	4607	1092	567	771	648	448	452	216	104	115	112	82	...
Redcedar	1767	1659	...	...	48	...	60	...	...	...	...	...	...
Hemlock-spruce	84	...	...	...	65	...	...	19	...	...	...	...	...
Cypress	33880	17733	11351	2679	1160	298	271	82	96	94	43	72	...
Total softwoods	807108	340559	221383	104940	61164	32255	21648	12499	7012	3288	1297	1046	19
Select white oaks	33690	19829	5745	3235	1448	965	796	610	338	287	169	249	20
Select red oaks	4103	1558	1512	86	344	87	102	97	80	51	50	109	27
Other white oaks	66990	44119	10414	5483	2955	1665	924	675	437	93	126	89	9
Other red oaks	338334	241615	46058	20807	10733	7530	4485	2738	1544	1170	598	918	137
Sweet pecan	94	...	...	...	...	...	59	21	...	...	...	6	8
Water hickory	1600	1386	...	...	...	86	...	45	35	22	19	7	...
Other hickories	26742	20335	1574	2009	942	603	438	386	208	110	96	40	...
Persimmon	24994	22178	2618	97	71	...	29	...	...	...	...	...	...
Hard maple	93	...	...	93	...	...	...	...	...	...	...	...	...
Soft maple	201852	163877	21567	10355	3678	1183	606	306	116	98	53	13	...
Boxelder	50	...	...	...	...	50	...	...	...	...	...	...	...
Beech	2972	1615	548	...	65	158	145	66	110	85	79	88	13
Sweetgum	170968	118096	29087	11415	6051	3076	1252	741	506	321	172	226	25
Blackgum	239069	155071	43934	18447	8628	4704	3303	2808	1189	527	231	189	38
Other gums/tupelos	34559	11387	8510	3888	4322	2896	1479	954	491	390	80	150	12
White ash	941	...	802	241	...	70	...	...	18	...	10	...	...
Other ashes	16181	10441	3188	1586	397	209	108	83	101	11	29	27	...
Sycamore	352	...	...	...	201	37	47	41	15	...	11	...	...
Yellow-poplar	40961	23735	6290	3348	2530	1576	1550	916	478	269	93	155	21
Magnolia	14052	11592	987	343	401	260	286	65	38	33	29	18	...
Sweetbay	163273	108446	24740	12762	7622	4044	2599	1261	1039	363	281	107	9
Willow	6405	5089	1032	131	...	100	...	20	33	...	...	...	...
Black walnut	82	...	...	...	82	...	...	...	...	...	...	...	...
Black cherry	43706	31620	8047	2635	822	462	57	16	...	27	...	20	...
American elm	2731	1167	524	372	191	251	90	81	17	28	...	7	4
Other elms	7354	5375	1178	136	338	122	88	59	34	...	9	15	...
River birch	2809	1571	524	386	203	33	28	34	32	...	...	...	...
Hackberry	4149	2192	1134	393	261	81	27	40	...	12	9	...	...
Sassafras	13055	10977	1563	280	208	...	27	...	...	...	...	...	...
Dogwood	142611	101495	30911	8835	1245	125	...	...	...	...	...	...	...
Holly	38654	32053	4272	1082	801	228	134	21	64	...	...	...	...
Other commercial	23211	18273	4154	492	184	70	38	...	...	...	...	...	...
Total hardwoods	1666634	1165090	260711	108935	54723	30671	18699	12083	6924	3897	2144	2434	324
Noncommercial	236038	196705	20564	12492	4072	1820	177	100	64	14	19	8	3
All species	2709781	1702354	502658	226367	119959	64746	40523	24681	14000	7199	3460	3488	346

**Table 33—Number of growing-stock trees on timberland by detailed species and diameter class,
South Mississippi, 1987**

Species	All classes	Diameter class (inches at breast height)									
		5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million cubic feet -----											
Longleaf pine	38149	12486	7595	6136	5594	3469	1783	861	145	80	...
Slash pine	78517	38626	20317	9750	5095	2492	1430	522	226	59	...
Shortleaf pine	21383	8898	5526	3015	2274	1117	313	187	31	22	...
Loblolly pine	85624	33661	23121	10931	7238	4747	3125	1432	649	700	19
Spruce pine	2727	608	590	448	452	216	104	115	112	82	...
Redcedar	75	...	48	...	27	...	...	...	...	...	...
Hemlock-spruce	84	...	65	...	...	19	...	...	...	...	...
Cypress	4442	2539	1106	219	228	82	81	83	32	72	...
Total softwoods	231000	96819	58367	30498	20909	12141	6836	3200	1196	1015	19
Select white oaks	6557	2646	1076	840	685	542	183	252	130	186	17
Select red oaks	870	...	344	87	76	97	65	51	50	81	20
Other white oaks	9917	4377	2626	1397	566	462	250	64	82	82	9
Other red oaks	39761	15776	9198	6586	2983	2092	1236	763	488	576	62
Sweet pecan	61	...	...	...	30	21	...	...	...	6	4
Water hickory	183	...	...	86	...	45	35	10	...	7	...
Other hickories	3740	1368	870	559	323	298	175	98	22	26	...
Persimmon	29	...	...	...	29	...	...	...	...	...	...
Hard maple	93	93	...	...	...	...	...	...	...	...	...
Soft maple	8519	5430	1846	660	336	137	36	54	20	...	...
Boxelder	50	...	...	50	...	...	...	...	...	...	...
Beech	430	...	65	113	58	24	80	13	41	33	4
Sweetgum	19435	8764	5417	2683	887	612	473	256	151	178	16
Blackgum	30279	13186	7003	4020	2304	2214	905	431	132	80	3
Other gums/tupelos	11955	2810	3845	2555	1086	870	380	291	60	55	4
White ash	191	127	...	37	...	...	18	...	10	...	...
Other ashes	1932	1156	329	164	77	64	83	11	19	27	...
Sycamore	342	...	201	37	47	41	15	...	...	...	...
Yellow-poplar	8846	2547	2323	1337	1117	791	316	220	61	128	5
Magnolia	1046	343	252	168	162	44	18	12	29	18	...
Sweetbay	19344	8853	5566	2469	1426	420	379	123	81	26	...
Willow	196	131	...	50	...	...	15	...	...	...	...
Black walnut	82	...	82	...	...	...	...	...	...	...	...
Black cherry	2411	1536	404	420	35	...	...	15	...	...	...
American elm	900	372	122	210	58	81	17	28	...	7	4
Other elms	802	136	338	122	88	59	34	...	9	15	...
River birch	532	301	146	33	...	21	32	...	...	...	...
Hackberry	530	188	182	81	27	40	...	12	...	...	...
Sassafras	131	...	131	...	...	...	...	...	...	...	...
Dogwood	1942	1718	224	...	...	...	...	...	...	...	...
Holly	1564	770	572	106	80	21	15	...	...	...	...
Other commercial	262	101	130	31	...	...	...	...	...	...	...
Total hardwoods	172930	72729	43293	24902	12482	8996	4759	2703	1386	1531	148
All species	403930	169548	101660	55400	33391	21137	11595	5903	2582	2546	167

Table 34—Volume of growing-stock trees on timberland by species and diameter class,
South Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)									
		5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Million cubic feet-----											
Longleaf pine	539.6	36.0	52.8	84.9	125.3	107.4	74.2	43.7	9.1	6.3	...
Slash pine	638.0	92.8	127.3	121.9	104.0	79.2	61.4	30.3	15.3	5.9	...
Shortleaf pine	222.3	25.5	40.1	43.0	49.0	35.2	15.2	10.3	2.3	1.7	...
Loblolly pine	956.8	80.3	142.8	132.3	142.8	136.1	126.0	75.5	44.2	73.3	3.4
Spruce pine	52.9	2.0	3.8	5.8	8.1	5.9	4.9	6.9	7.5	7.9	...
Redcedar	0.7	...	0.3	...	0.4	...	...	...	...	...	...
Hemlock-spruce	0.8	...	0.3	...	...	0.5	...	...	...	...	...
Cypress	31.7	4.8	6.0	2.1	3.0	1.6	2.5	4.0	1.4	6.2	...
Total softwoods	2442.7	241.4	373.4	390.0	432.8	365.9	284.1	170.6	79.9	101.3	3.4
Select white oaks	88.9	7.3	6.0	9.7	12.1	13.5	6.4	10.7	6.8	13.4	3.0
Select red oaks	26.5	...	1.6	0.8	1.5	2.8	2.3	2.8	3.0	7.8	4.0
Other white oaks	72.5	9.3	12.9	11.8	8.9	9.5	6.7	2.3	4.0	5.6	1.6
Other red oaks	405.9	42.5	53.7	64.5	48.9	49.2	39.2	31.5	26.2	42.5	7.9
Sweet pecan	1.7	...	...	...	0.4	0.5	...	...	...	0.5	0.2
Water hickory	4.7	...	...	1.0	...	0.9	1.4	0.6	...	0.7	...
Other hickories	35.4	2.4	3.9	4.7	4.9	6.8	6.1	3.7	1.3	1.5	...
Persimmon	0.4	...	...	...	0.4	...	...	...	...	...	...
Hard maple	0.4	0.4	...	...	...	...	...	...	...	...	...
Soft maple	42.3	14.4	10.4	5.7	5.4	2.7	0.8	2.0	0.8	...	...
Boxelder	0.4	...	...	0.4	...	...	...	...	...	...	...
Beech	10.8	...	0.4	1.4	0.6	0.4	2.6	0.6	1.9	2.6	0.5
Sweetgum	173.1	20.3	31.9	28.9	16.4	16.7	17.5	12.5	10.0	16.3	2.5
Blackgum	265.2	30.2	39.0	42.1	38.4	54.3	30.6	18.0	7.3	5.1	0.3
Other gums/tupelos	130.7	7.0	23.1	28.1	19.2	20.5	12.6	13.2	3.1	3.6	0.4
White ash	2.1	0.4	...	0.4	...	...	0.6	...	0.7	...	...
Other ashes	16.6	3.2	2.1	1.8	1.4	1.5	2.9	0.5	1.1	2.0	...
Sycamore	4.5	...	1.1	0.6	1.2	1.1	0.6	...	...	...	...
Yellow-poplar	109.6	7.5	14.4	14.4	19.0	19.7	11.4	9.7	3.3	9.3	0.8
Magnolia	11.6	0.9	1.7	1.7	2.8	1.0	0.6	0.3	1.4	1.3	...
Sweetbay	143.7	25.7	35.6	26.7	23.5	9.7	12.1	4.8	3.9	1.6	...
Willow	1.0	0.2	...	0.4	...	...	0.4	...	...	...	...
Black walnut	0.2	...	0.2	...	...	...	...	...	...	...	...
Black cherry	11.9	3.9	2.7	4.4	0.5	...	...	0.4	...	...	...
American elm	9.8	1.2	1.0	2.2	1.2	1.9	0.3	1.2	...	0.5	0.3
Other elms	8.7	0.2	1.7	1.1	1.6	1.6	0.9	...	0.5	1.1	...
River birch	4.0	1.1	0.8	0.4	...	0.6	1.2	...	...	...	...
Hackberry	4.1	0.4	1.2	0.9	0.5	0.7	...	0.4	...	...	...
Sassafras	0.7	...	0.7	...	...	...	...	...	...	...	...
Dogwood	4.1	3.2	0.9	...	...	...	...	...	...	...	...
Holly	7.7	1.9	3.0	0.8	1.1	0.3	0.6	...	...	...	...
Other commercial	1.0	0.2	0.5	0.3	...	...	...	...	...	...	...
Total hardwoods	1600.2	183.8	250.6	255.3	209.9	215.7	157.7	115.2	75.1	115.5	21.4
All species	4042.9	425.2	624.0	645.4	642.7	581.6	441.8	285.8	155.0	216.7	24.8

Table 35—Volume of growing stock in the saw-log portion of sawtimber trees on timberland by detailed species and diameter class, South Mississippi, 1987

Species	Diameter class (inches at breast height)								
	All classes	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
----- Million cubic feet -----									
Longleaf pine	390.9	68.5	111.2	95.5	64.7	37.6	8.0	5.4	...
Slash pine	363.4	92.9	91.5	73.9	57.1	28.1	14.3	5.6	...
Shortleaf pine	136.8	35.2	44.0	31.4	13.7	9.0	2.0	1.4	...
Loblolly pine	643.9	105.7	125.4	122.4	113.4	67.6	40.3	66.0	3.0
Spruce pine	42.5	5.0	7.1	5.3	4.6	6.4	6.6	7.6	...
Redcedar	0.4	...	0.4	...	...	...	...	...	...
Hemlock-spruce	0.4	...	...	0.4	...	...	...	...	...
Cypress	19.0	1.7	2.4	1.5	2.3	3.9	1.3	6.1	...
Total softwoods	1597.3	309.0	382.0	330.5	255.9	152.4	72.5	92.0	3.0
Select white oaks	55.5	...	9.0	11.3	5.5	9.4	5.8	12.1	2.5
Select red oaks	22.3	...	1.1	2.5	2.2	2.5	2.8	7.3	3.9
Other white oaks	32.9	...	7.0	8.0	6.0	1.9	3.4	4.9	1.6
Other red oaks	208.0	...	35.1	41.3	34.8	27.5	23.7	38.3	7.3
Sweet pecan	1.3	...	0.3	0.4	...	...	...	0.3	0.2
Water hickory	3.2	...	...	0.9	1.1	0.5	...	0.7	...
Other hickories	20.1	...	3.7	5.7	4.9	3.2	1.1	1.5	...
Persimmon	0.3	...	0.3	...	...	...	...	...	...
Soft maple	9.5	...	4.0	2.4	0.7	1.6	0.8	...	...
Beech	8.0	...	0.6	0.3	2.0	0.6	1.6	2.5	0.5
Sweetgum	77.8	...	11.1	14.1	15.2	11.4	8.8	15.1	2.1
Blackgum	131.6	...	28.6	47.5	27.8	15.9	6.9	4.7	0.3
Other gums/tupelos	62.2	...	14.4	16.7	11.9	12.3	3.0	3.5	0.4
White ash	1.0	...	...	...	0.5	...	0.5	...	...
Other ashes	8.2	...	1.2	1.0	2.7	0.5	1.1	1.7	...
Sycamore	2.3	...	0.9	0.9	0.4	...	...	...	...
Yellow-poplar	60.6	...	13.3	16.8	10.1	8.8	2.9	8.1	0.7
Magnolia	6.5	...	2.2	0.8	0.6	0.3	1.4	1.3	...
Sweetbay	45.7	...	17.7	8.0	10.5	4.5	3.5	1.4	...
Willow	0.2	...	...	...	0.2	...	...	...	...
Black cherry	0.8	...	0.4	...	...	0.4	...	...	...
American elm	4.5	...	0.8	1.7	0.3	1.0	...	0.4	0.3
Other elms	4.4	...	0.8	1.2	0.9	...	0.5	0.9	...
River birch	1.4	...	...	0.5	0.9	...	...	...	...
Hackberry	1.2	...	0.3	0.5	...	0.4	...	...	...
Holly	1.7	...	0.9	0.3	0.6	...	...	...	...
Total hardwoods	771.0	...	153.7	182.7	139.6	102.7	67.7	104.9	19.6
All species	2368.3	309.0	535.8	513.2	395.5	255.1	140.2	196.9	22.6

**Table 36—Volume of timber on timberland by species and class of timber,
South Mississippi, 1987**

Species	All live	Growing stock	Rough	Rotten
----- Million cubic feet -----				
Longleaf pine	547.9	539.6	8.3	...
Slash pine	657.9	638.0	19.9	...
Shortleaf pine	225.0	222.3	2.7	...
Loblolly pine	1000.5	956.8	42.9	0.9
Spruce pine	53.7	52.9	0.8	...
Redcedar	1.0	0.7	0.3	...
Hemlock-spruce	0.8	0.8	...	...
Cypress	34.2	31.7	1.2	1.3
Total softwoods	2521.1	2442.7	76.1	2.2
Select white oaks	104.7	88.9	14.3	1.5
Select red oaks	29.2	26.5	1.8	0.8
Other white oaks	92.3	72.5	19.4	0.4
Other red oaks	504.3	405.9	86.4	12.0
Sweet pecan	2.2	1.7	0.5	...
Water hickory	5.8	4.7	1.1	...
Other hickories	44.2	35.4	6.8	2.1
Persimmon	1.1	0.4	0.7	...
Hard maple	0.4	0.4	...	...
Soft maple	70.6	42.3	26.4	1.9
Boxelder	0.4	0.4	...	...
Beech	19.9	10.8	7.0	2.1
Sweetgum	201.5	173.1	24.8	3.6
Blackgum	323.7	265.2	48.4	10.1
Other gums/tupelos	152.9	130.7	17.5	4.7
White ash	2.6	2.1	0.6	...
Other ashes	19.3	16.6	2.7	...
Sycamore	5.0	4.5	0.5	...
Yellow-poplar	129.5	109.6	18.3	1.6
Magnolia	15.4	11.6	3.8	...
Sweetbay	226.0	143.7	64.8	17.4
Willow	1.9	1.0	0.9	...
Black walnut	0.2	0.2	...	...
Black cherry	17.5	11.9	5.2	0.3
American elm	10.8	9.8	1.0	...
Other elms	8.7	8.7	...	...
River birch	5.3	4.0	1.3	...
Hackberry	5.5	4.1	1.0	0.4
Sassafras	2.1	0.7	0.9	0.4
Dogwood	16.8	4.1	12.6	0.1
Holly	11.6	7.7	3.7	0.2
Other commercial	2.4	1.0	1.4	...
Total hardwoods	2033.8	1600.2	373.8	59.8
Noncommercial	53.5	...	53.5	...
All species	4608.3	4042.9	503.4	62.0

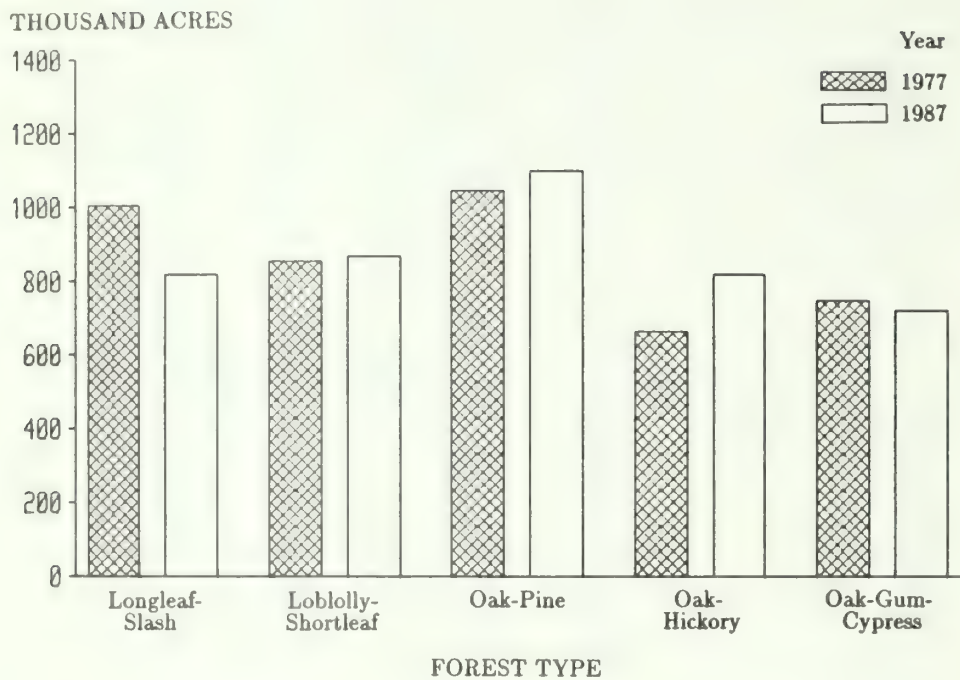


Figure 1.—Area of timberland by forest type, South Mississippi, 1977 and 1987.

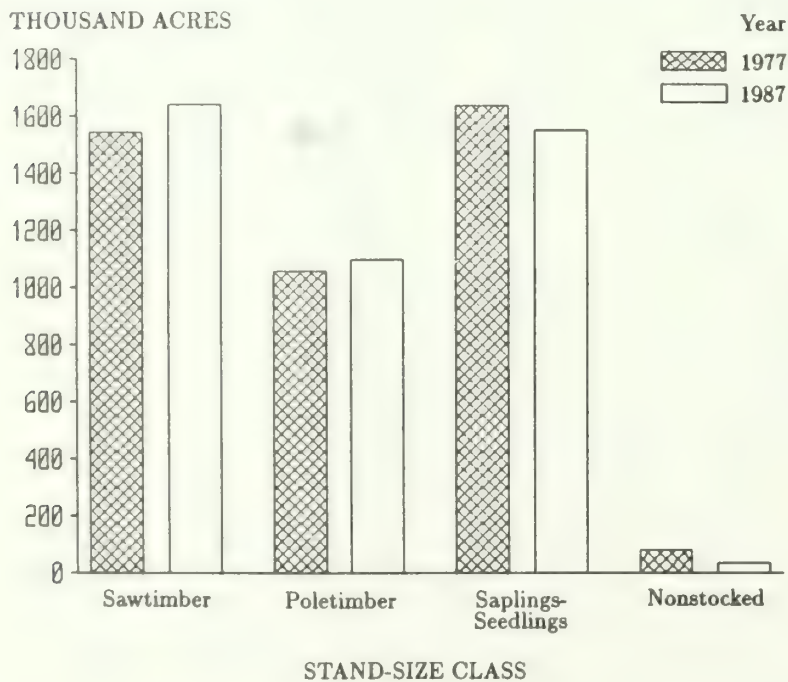


Figure 2.—Area of timberland by stand-size class, South Mississippi, 1977 and 1987.

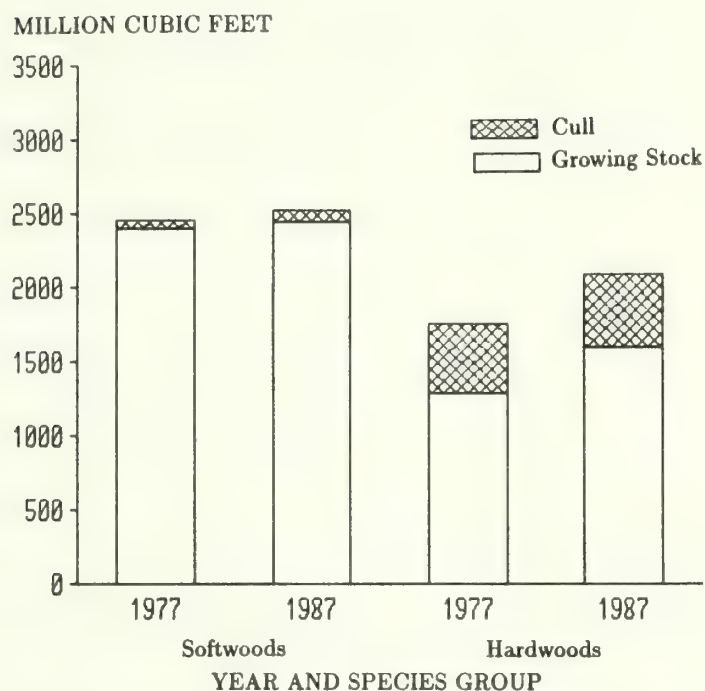


Figure 3.—Volume of timber on timberland by species group and class of timber, South Mississippi, 1977 and 1987.

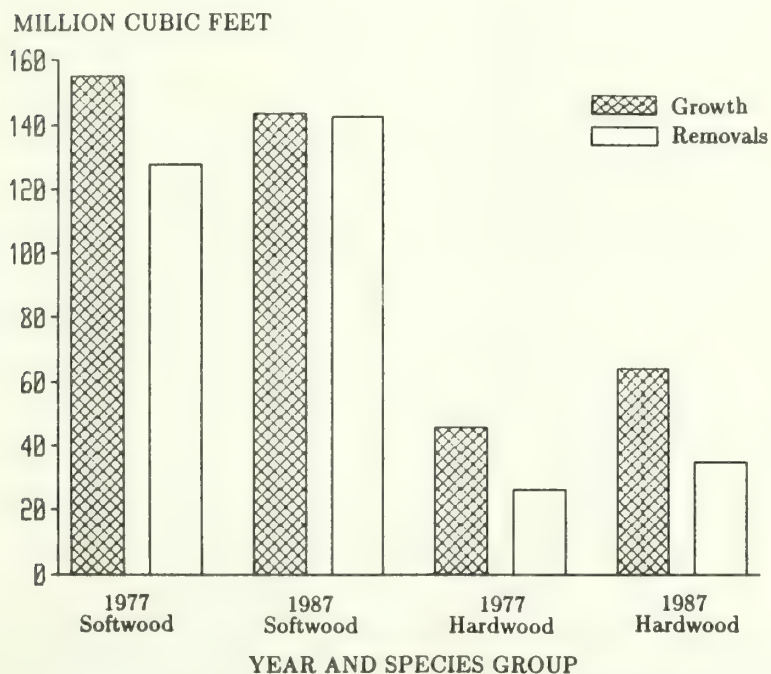


Figure 4.—Average net annual growth and average annual removals of growing stock on timberland by species group, South Mississippi, 1977 and 1987.

MILLION CUBIC FEET

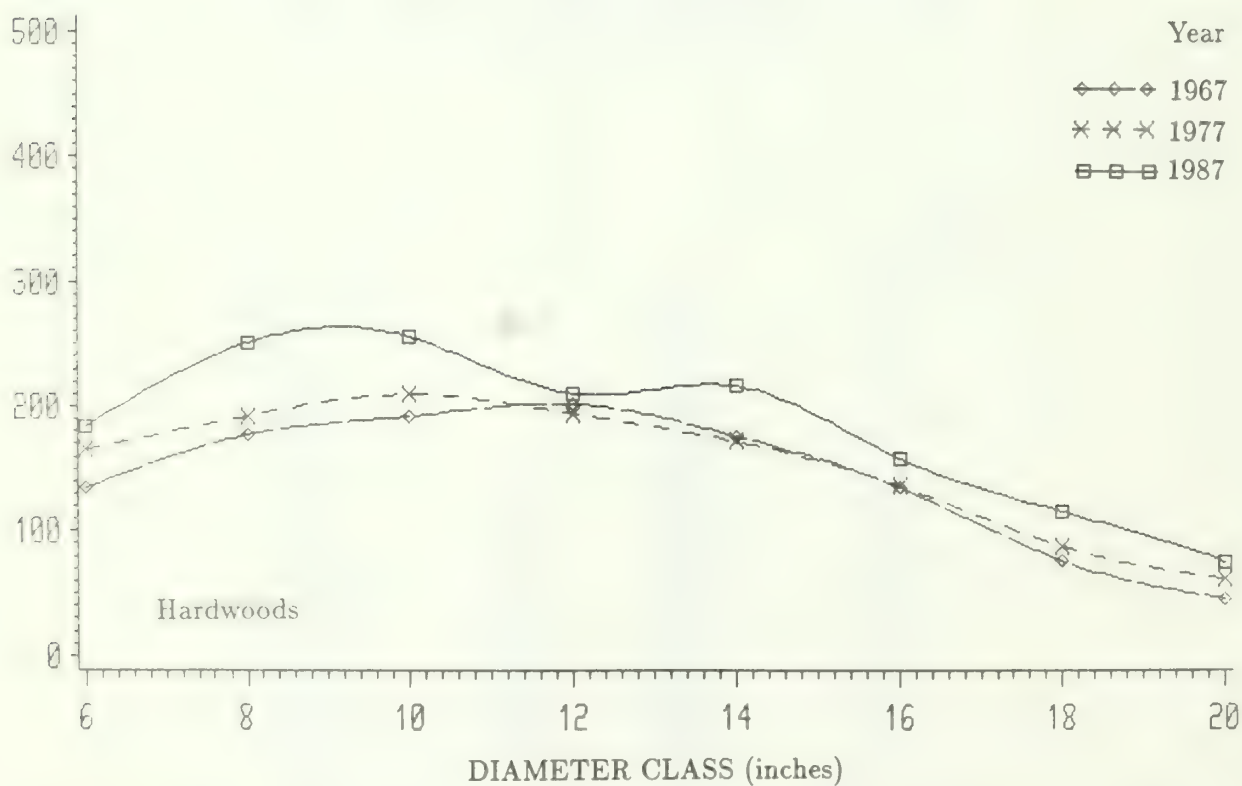
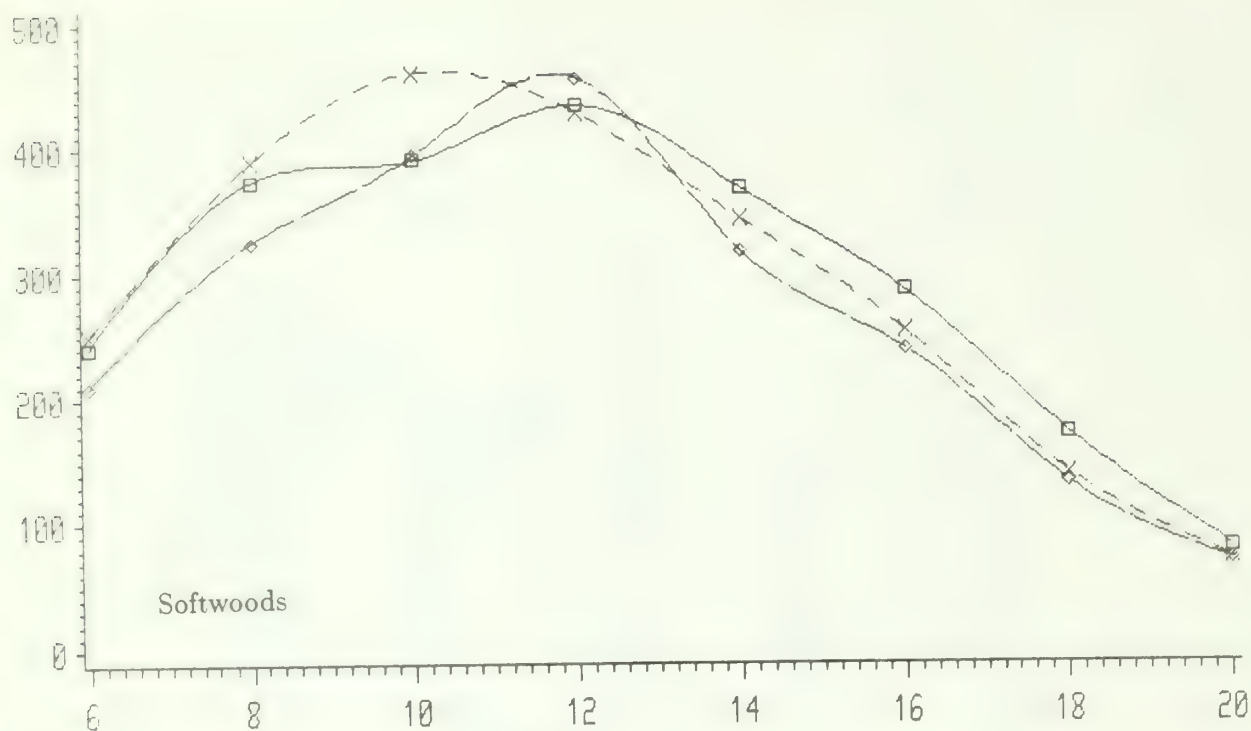


Figure 5.—Volume of softwood and hardwood growing stock on timberland by diameter class, South Mississippi, 1967, 1977, and 1987.

MILLION TREES

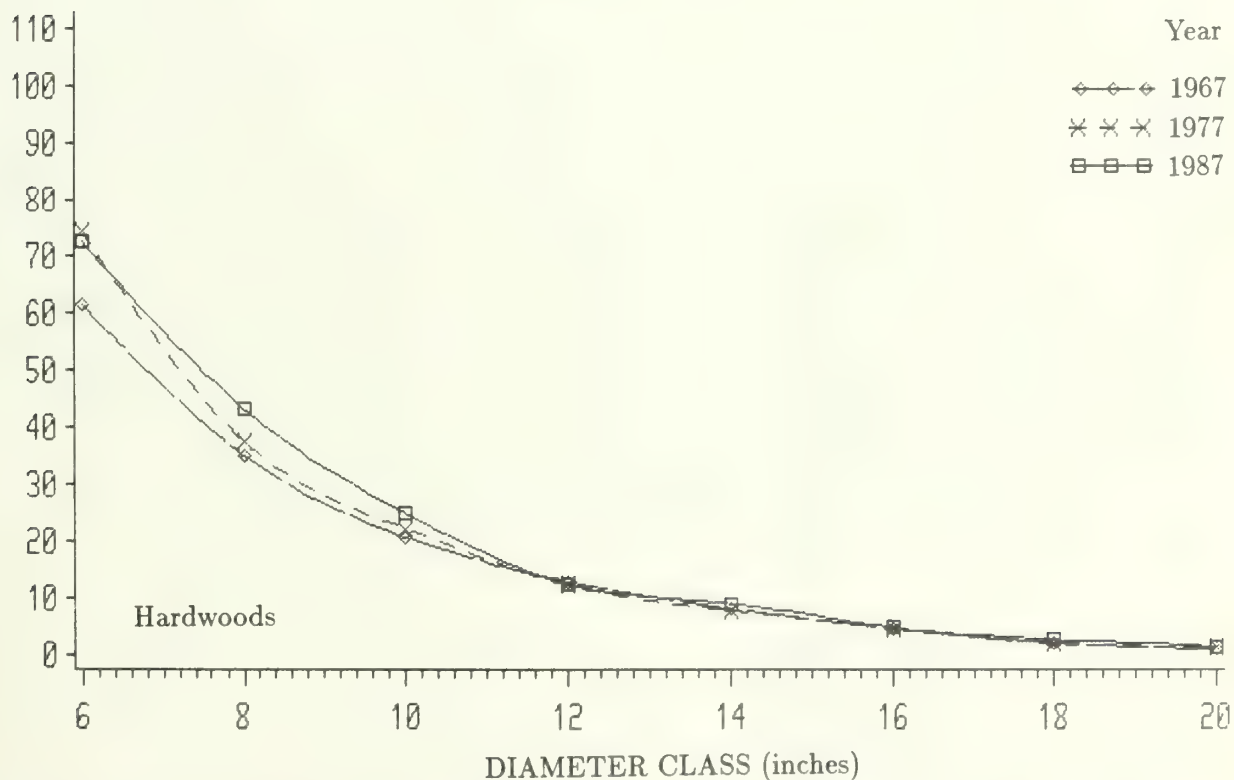
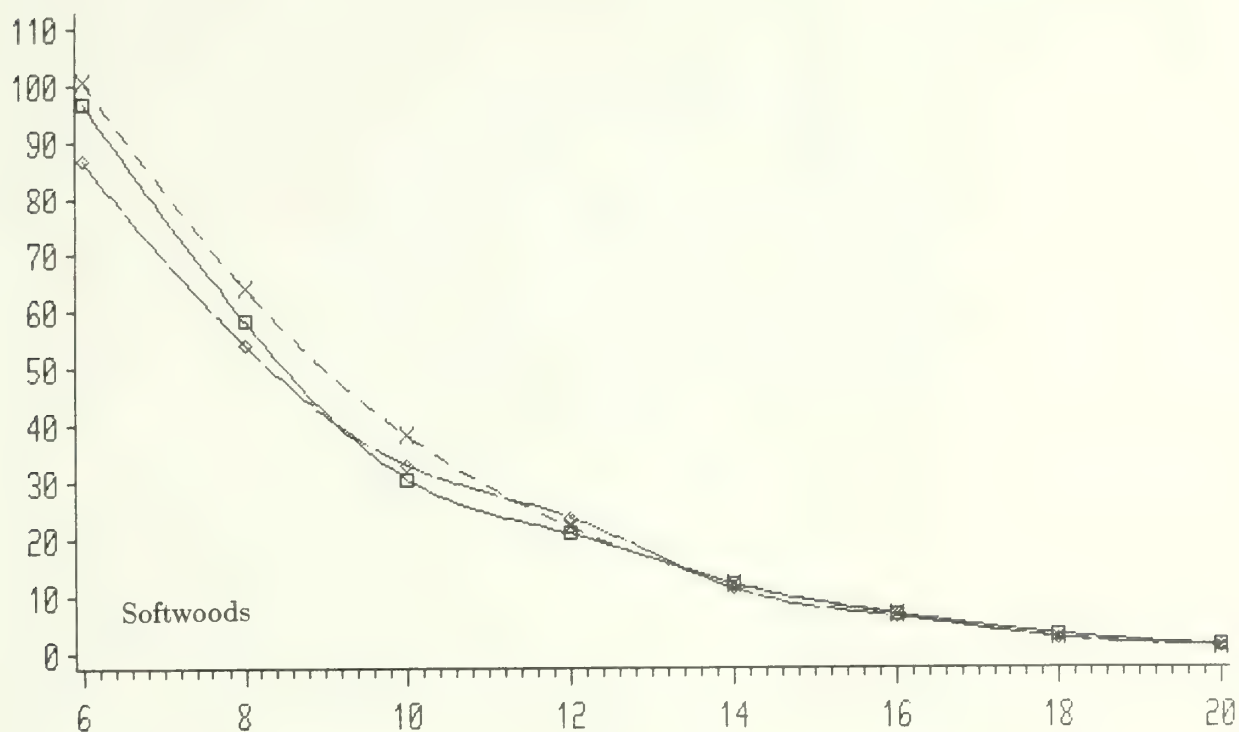


Figure 6.—Number of softwood and hardwood growing stock trees on timberland by diameter class, South Mississippi, 1967, 1977, and 1987.

PERCENT CHANGE

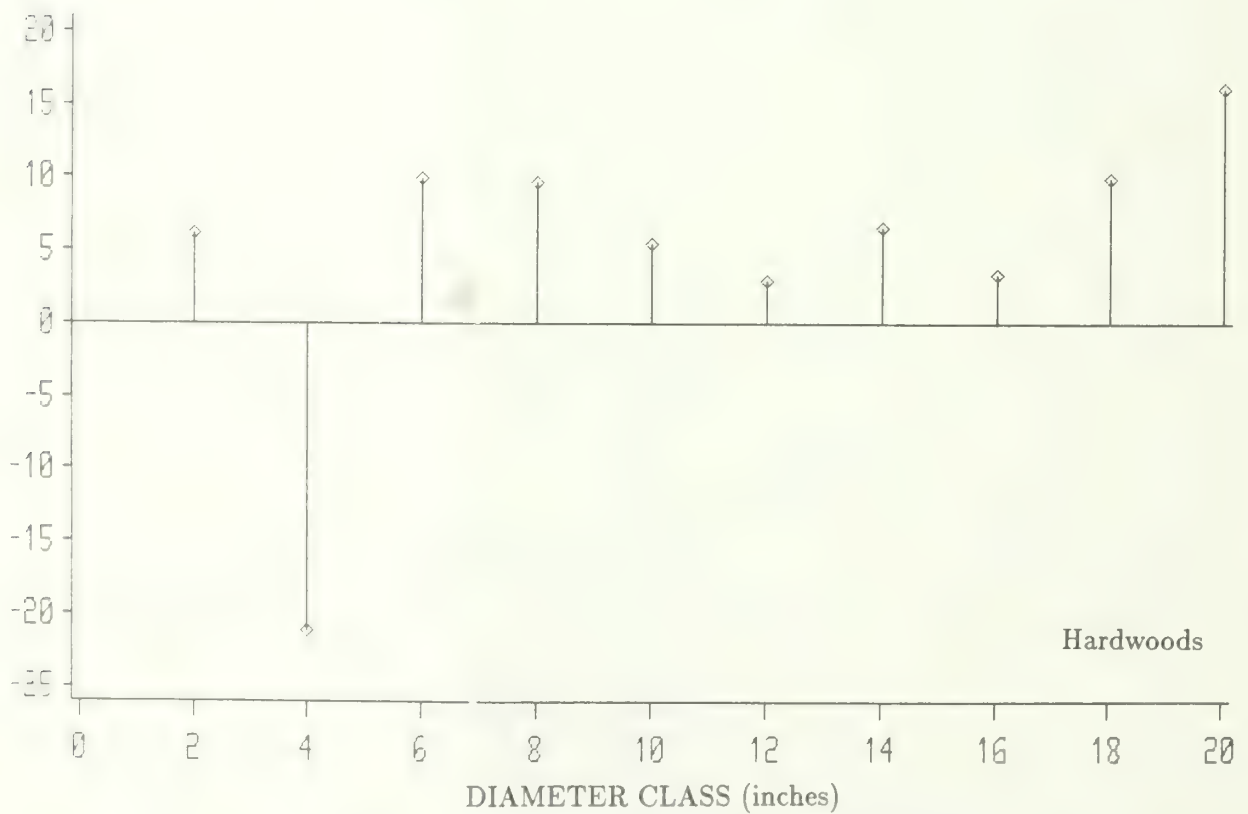
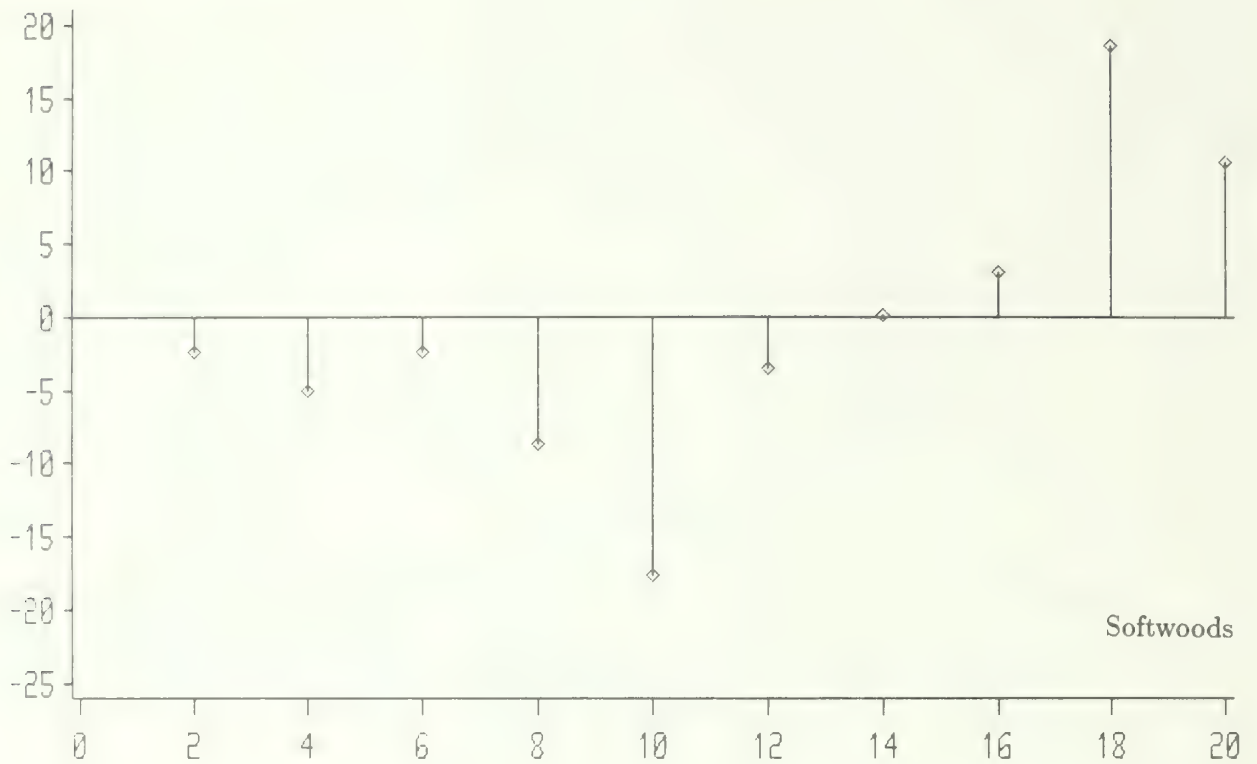


Figure 7.—Percent change in the number of live softwood and hardwood trees by diameter class, South Mississippi, 1977 to 1987.

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Tabulates forest resource information from a new inventory of South Mississippi counties.

Additional Keywords: Area, volume, forest type, stand size, ownership.



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Profiles of Midsouth Nonindustrial Private Forests and Owners

James F. Rosson, Jr. and Larry Doolittle



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INTRODUCTION

Information about the nonindustrial private forest (NIPF) and owner is readily available from many sources, but it often is presented in a manner that obscures differences and similarities between NIPFs and other ownership categories. This bulletin summarizes NIPF resources within the Midsouth States (fig. 1) and compares NIPF traits with other ownership classes.

Much of the data in this bulletin has been presented elsewhere, but in a different format. The resource characteristics (tables 1–10) are presented in the most recent State reports published by the Forest Inventory and Analysis Unit (FIA) of the Southern Forest Experiment Station (Rudis et al. 1984, Birdsey 1983, vanHees 1980, Murphy 1978, Murphy 1977, Murphy 1976, Murphy 1975). The one exception is the “forest management type” data in table 3. These data were compiled by FIA analysts as part of a study of the South’s timber supply.

The NIPF category in tables 1–10 is made up of three types of owners: “Farmer,” “Miscellaneous Private: Individual,” and “Miscellaneous Private: Corporate.” Each is defined in the FIA State reports. During the period from 1974 to 1982, these ownership classes held 68.3 million of the Midsouth’s 99.0 million acres of timberland—69 percent. This proportionate share of total ownership is one of many possible criteria that could be used as a basis for comparing NIPFs to other ownership categories. Because 69 percent of the Midsouth timberland area is in NIPF, it seems reasonable to assume that various resource characteristics would be distributed in similar proportions, assuming particular ownership classes do not have a built-in bias for types of land owned, especially with regard to productivity. Deviations of forest attribute proportions from the area proportions indicate the strengths and weaknesses of the NIPF resource, mainly the result of man-induced disturbance.



Figure 1.—Midsouth States surveyed by the Southern Forest Experiment Station.

The landowner characteristics (tables 11–18) were collected for the nationwide study of private forest landowners in 1978 by the Forest Service and the Economic Research Service. Although published earlier for the Nation and various regions (Birch et al., 1982), data for each of the seven Midsouth States are presented here for the first time. State survey data collected between 1974 and 1982 were used in this bulletin because of the relevancy in time to the landowner characteristics data (1978), even though data is available from more recent Midsouth State surveys.

THE NIPF RESOURCE

Timberland Area

Figure 2 illustrates the relative distribution of the three major ownership categories: public, forest industry, and NIPF. Each symbol represents an approximate plot location and each plot location represents, on average, 5,700 acres. The map was formulated from data collected by FIA survey crews in conjunction with measurement of on-the-ground plots.

The Midsouth has 99.0 million acres of timberland, of which 68.3 million acres are NIPF. The proportion of the total timberland owned by NIPF owners in Midsouth States ranges from 57 percent in Arkansas to 82 percent in Tennessee (table 1 and fig. 3). The proportions in the remaining five States are very close to the average Midsouth proportion of 69 percent. Obviously, the Midsouth's capability to contribute to the Nation's timber supply depends heavily upon the availability, condition, and production of these 68.3 million acres.

Two States, Arkansas and Tennessee, diverge significantly from the Midsouth mean for proportion of NIPF ownership. Tennessee is far above the Midsouth NIPF acreage average because of the lack of forest industry commitment to timberland acquisition. This is because of the emphasis on the pine resource. Climatically and edaphically, Tennessee is at the northern margin of the southern pine region and is not an area that can be considered highly suitable for converting low value hardwood stands to pine. Pine will perform poorly on many of these sites; thus, there is little incentive for forest industry activity. In addition many Tennessee landowners have left their marginal lands in trees or have allowed once-cleared lands to revert to forest.

In contrast to Tennessee, Arkansas is far below the Midsouth mean. This is due to two situations. A large proportion of timberland is in the public domain, most of which is National Forest land; and there are substantial forest industry timberland holdings in the southern and western portions of the State (fig. 2).

Stand-size Class

Forty-three percent of Midsouth timberland, 42.3 million acres, is in sawtimber stands. Of that, 65 percent is NIPF. Alabama, Louisiana, and Mississippi have the most acreage in NIPF sawtimber stands with 5.6, 5.1, and 5.1 million acres, respectively. Clearly, private landowner attitudes will have a direct impact on availability of the sawtimber resource.

The most striking feature of the distribution of stand-size classes across ownerships is the disproportionate area in NIPF ownership that is nonstocked (table 2 and fig. 4). Midsouth-wide, nearly 84 percent of the 1.3 million nonstocked acres occur on NIPF. Among individual States, only Tennessee has a smaller proportion of nonstocked acres compared to total acres of NIPF. Alabama has an almost equal proportion of nonstocked to total acres.

Proportionately, sawtimber stands on NIPF are in relatively short supply in all Midsouth States except Tennessee. On the other hand, the proportion of pole-timber acres exceeds the proportion of total acres in most Midsouth States, and seedling and sapling acres are represented in expected proportion to total acres.

The amount of timberland by stand-size class gives a crude indication of the balance of forest stands with harvest rotations. Roughly one-third of the forest area should be in sawtimber, one-third in poletimber, and one-third in seedlings and saplings at any given time. Currently, the stand-size proportions on NIPFs are 40 percent, 34 percent, and 25 percent for sawtimber, poletimber, and seedling and sapling stands, respectively. Adequate proportions of sawtimber stands are available for the near future but there is concern that many harvested acres will not be regenerated in a timely manner and, consequently, much of this acreage will shift to a nonstocked or poorly stocked condition. Already, of the more than 17.5 million acres of poorly stocked timberland in the Midsouth, 77 percent is on NIPF.

Forest Management Classes

Only 2.9 million of the Midsouth's 9.0 million acres of pine plantations are held by NIPF owners—about 32 percent (table 3 and fig. 5). Even though timber removals from NIPFs are below the proportionate share, the acreage of pine plantations on NIPFs is far below the area available (after removals) for stand establishment. Many NIPF owners may wish to rely on natural regeneration for reasons ranging from economical to ecological. However, indifference and/or lack of incentive may explain why so few plantations are on these lands. Unless owners have taken steps to put their timberland into a management plan, it is highly unlikely that a proportion of harvest money will be diverted to regeneration expenses. Instead,

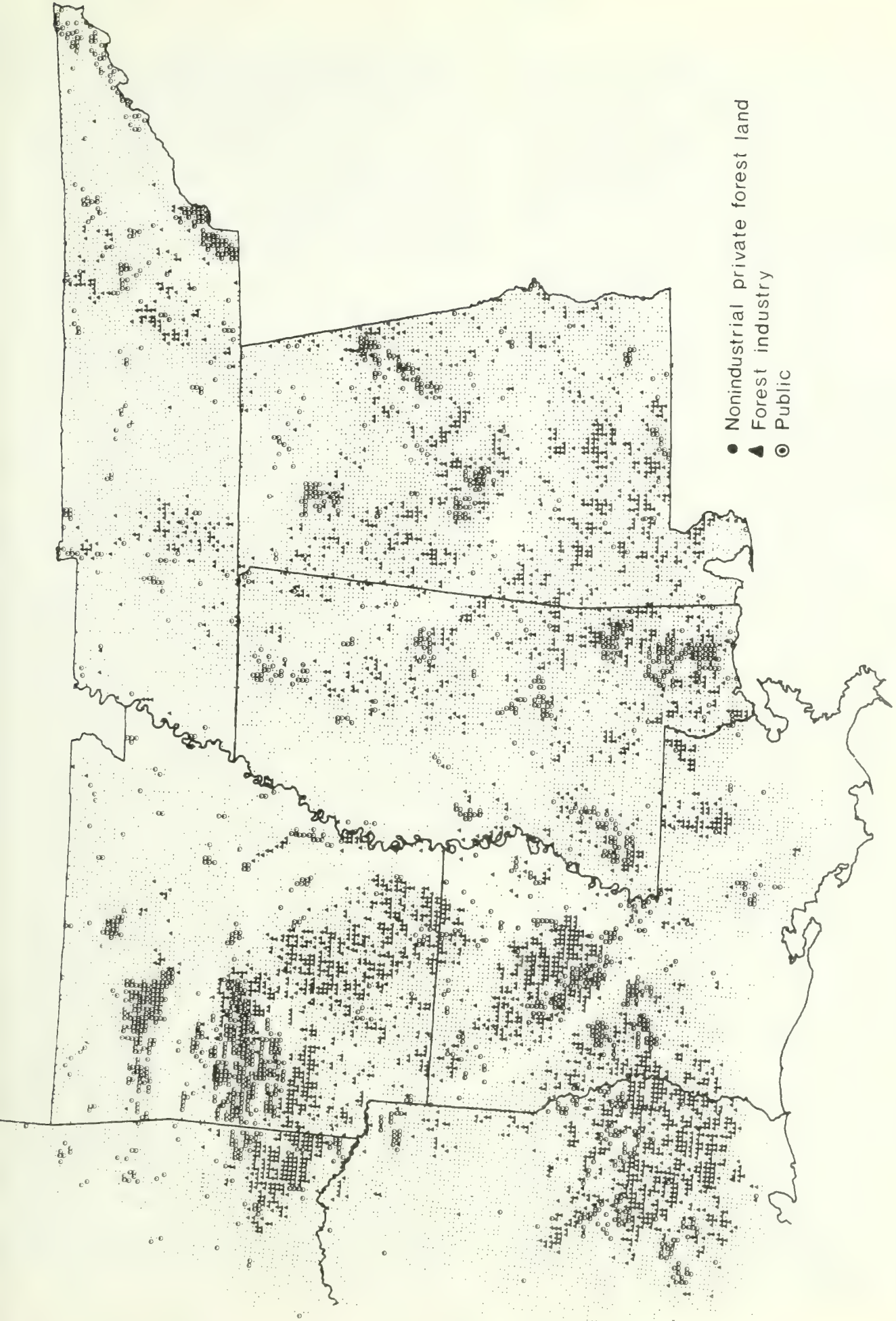


Figure 2.—Distribution of ownership in the Midsouth States. Each dot represents approximately 5,700 acres.

stands are replaced by natural responses, resulting in decreases in pine and subsequent increases in hardwood. Hardwoods have an accelerated advantage on such sites because of vegetative reproducing capabilities coupled with generally inadequate seed sources left for pine. Of the southern pines, only shortleaf pine is a significant sprouter and only on stumps from trees up to 6 to 8 inches in diameter. Loblolly pine only sprouts from 1 to 3-year-old seedlings. Therefore, adequate pine regeneration cannot rely on vegetative reproduction from these two species. Only purposeful input from artificial regeneration or seed trees will provide adequate pine stocking after harvest.

Natural pine is also proportionately under-represented on NIPF acres—59 percent for the Midsouth. Hardwoods are dominant on 38.9 million acres of NIPF—three-fourths of the region's hardwood acres. Upland hardwoods are over-represented to a greater extent than bottomland hardwoods—78 percent to 70 percent.

The distribution of management classes in the individual States follows the same general pattern as that for the region. Upland hardwoods are most frequently encountered on NIPFs in every State except Louisiana. Bottomland hardwoods and mixed pine-hardwoods occur in about the same proportion as total NIPF acres in most of the States.

Forest Type

A detailed breakdown of forest type is presented in table 4. In all States, NIPF owners hold less than their proportionate share of the three pine forest types (including oak-pine) and in most States they own a larger proportion of the three hardwood forest types. These conditions exist because of geomorphology, site conditions, and stand history, and also because of continued removal of pine without efforts to ensure adequate regeneration.

The longleaf-slash pine forest type covers 3.8 million acres in the Midsouth. Three States, Alabama, Louisiana, and Mississippi, hold 93 percent of the total resource. NIPF owners hold 49 percent of this acreage.

Of the 24.9 million acres in the loblolly-shortleaf pine forest type, 57 percent is on NIPF. Alabama, Mississippi, Texas and Louisiana have the most acreage in this type on NIPF. Most of the States have 60 percent of NIPF ownership in this type; Oklahoma and Arkansas stand out with only 31 and 38 percent respectively, on NIPF.

The proportion of NIPF ownership increases as the hardwood component in forest types increases. In the oak-pine forest type the Midsouth has 17.4 million acres; 64 percent of this on NIPF. Alabama and Mississippi have 3.3 million and 2.5 million acres, respectively, on NIPF.

The oak-hickory forest type occupies 34.5 million Midsouth acres of which 27.4 million acres are NIPF. Tennessee, Alabama, Arkansas, and Mississippi, together, have 80 percent of this forest type on NIPF.

The oak-gum-cypress type, with a Midsouth total of 16.2 million acres, is most prominent in Louisiana. Of Louisiana's 5.0 million acres, 3.8 million acres are NIPF. Louisiana and Mississippi, together, have 53 percent of the NIPF acreage in this forest type in the Midsouth.

Stand Volume

The area of timberland in three major volume-per-acre classes is shown in table 5 and figure 6. Stands containing less than 1,500 board feet per acre (International 1/4 rule) are slightly more prominent on NIPFs in all States except Alabama. At the other extreme, stands containing more than 5,000 board feet per acre are proportionately more scarce on NIPFs in all seven States. A more detailed examination of timber volume on NIPF land is presented later.

Site Class

The various site classes shown in table 6 and figure 7 occur on NIPF in proportions nearly equal to that of the total area of timberland in the Midsouth. Exceptions are in Oklahoma, Tennessee, and Texas where NIPF owners hold title to more than their proportionate share of poor sites. Overall, however, shortfalls in forest productivity on NIPF cannot be attributed to poor site conditions. Even though Arkansas has the most Midsouth acreage in the lowest site class category, 71 percent of it is on NIPF, close to the expected distribution among ownership classes.

Growing-stock Characteristics

Softwood growing-stock volume, annual growth, annual removals, and mortality are shown in table 7. Figure 8 illustrates the proportion of cubic foot volume of each of these characteristics on NIPF. The relative volume-to-area ratios—57 percent to 69 percent—in the Midsouth illustrate the lower stocking levels and under-representation of sawtimber stands discussed previously. This same condition exists, varying only in degree, in each of the Midsouth States.

The other softwood growing-stock attributes—growth, removals, and mortality—are also analyzed by comparing the respective NIPF proportion with the NIPF area proportion. For the region as a whole, 62 percent of the net annual growth occurs on NIPF, 7 percent lower than expected. Three conditions can contribute to a lower growth-rate: a large proportion

of timberland acreage in very old stands; low stocking levels (fewer trees to contribute to stand growth); and a large percentage of acreage in very young stands. FIA does not measure tree growth until a tree becomes at least 5.0 inches in diameter and is of an acceptable (no cull) tree class. Thus, these very young stands contribute no growth in FIA data. Similarly, the NIPF annual removals proportion of total removals is substantially lower than the NIPF area proportion (56 percent to 69 percent). The mortality proportion is also less than the area proportion (61 percent to 69 percent). Since the softwood volume is less than expected in relation to area, it is logical that removals and mortality will also be closely tied with volume. Nonetheless, an NIPF weakness in one attribute will strengthen or weaken other attributes, correspondingly. In this instance, softwood removals and mortality are less than the expected proportion because there is less than the expected softwood volume to begin with.

The softwood volume on NIPF for the Midsouth averages 413 cubic feet per acre versus 689 cubic feet per acre for all other ownerships. This is a very large difference of 276 cubic feet per acre. On NIPF, volumes per acre range from 114 cubic feet in Oklahoma to 566 cubic feet in Louisiana. Alabama, Texas, Mississippi, Arkansas, and Tennessee follow Louisiana with 500, 483, 471, 345, and 160 cubic feet per acre.

Average net annual growth for softwood on NIPF is 26 cubic feet per acre. This is 10 cubic feet per acre lower than that reported for all other ownerships. Excluding the bottomland physiographic class raises the net annual softwood growth to 32 cubic feet per acre on NIPF versus 43 cubic feet per acre on all other ownerships.

The softwood growth-to-removal ratio for the Midsouth on NIPF is 1.32. Individual States range from 1.02 for Alabama to 3.00 for Tennessee. Recent information suggests that the ratio for the Midsouth on NIPF land will approach 1.00 as industrial expansion will necessitate access to the NIPF resource where possible. If regeneration is not implemented on these harvested acres the growth-to-removal ratio will close to 1.00 very rapidly.

The proportion of the Midsouth's hardwood growing-stock volume on NIPF (72 percent) slightly exceeds the proportion of total timberland in NIPF ownerships (table 8 and fig. 9). The annual growth, annual removals, and mortality proportions also exceed but are very close to the NIPF area proportion in the Midsouth. Many of the States, however, diverge substantially from expected proportions of the above attributes.

Hardwood volume on NIPF in the Midsouth averages 538 cubic feet per acre versus 468 cubic feet per acre for all other lands. On NIPF, the volume per acre ranges from 805 cubic feet per acre in Tennessee to

241 cubic feet per acre in Oklahoma. Arkansas, Louisiana, Mississippi, and Texas follow Tennessee with 559, 548, 520, and 382 cubic feet per acre, respectively. Per acre estimates are based on all timberland for hardwood computations.

Hardwood net annual growth averages 23 cubic feet per acre on NIPF in the Midsouth. On all other ownerships, hardwood net annual growth averages 19 cubic feet per acre. If softwood plantation acreage is excluded, net annual growth averages 24 cubic feet per acre on NIPF and 23 cubic feet per acre on all remaining ownerships. Net annual growth per acre ranges from a high of 33 cubic feet per acre in Tennessee to a low of 14 cubic feet per acre in Oklahoma.

The growth-to-removal ratios for Midsouth NIPF hardwoods is 2.03. Resource drain will not be a problem for hardwoods on NIPFs in the near future. The growth-to-removal ratios range from 3.36 in Oklahoma to 1.65 in Alabama. As more products are developed to utilize existing hardwoods, (particle board, etc.), the drain on the NIPF hardwood resource will increase substantially.

Sawtimber Characteristics

The relatively low supply of pine sawtimber on NIPF has been illustrated already. Table 9 and figure 10 depict the softwood sawtimber situation from the perspectives of board-foot volume, annual growth, annual removals, and mortality. While holding 69 percent of timberland, NIPF owners have only 54 percent of the softwood sawtimber volume. In individual States, NIPF owners in Alabama come closest to owning their proportionate share of sawtimber volume. All other Midsouth States are below their expected volume. Almost one-third of NIPF softwood sawtimber volume in the Midsouth is in Alabama.

The proportion of softwood sawtimber net annual growth on NIPF, for the Midsouth, is about 10 percent less than expected. None of the individual States has softwood sawtimber growth above that of areal proportion. Again, Alabama is closer than any other State to expected growth.

Similarly, removals and mortality of softwood sawtimber are less than the proportion of area on NIPF. Oklahoma stands out with 64 percent of its timberland in NIPF but only 13 percent of softwood sawtimber removals are on these lands.

Hardwood sawtimber volume on NIPF is proportionately very close to NIPF forest acreage across the Midsouth and in each State (table 10 and fig. 11). The NIPF hardwood sawtimber resource is much more prominent than the softwood resource across the Midsouth. Alabama is the exception, where a strong softwood inventory also prevails on NIPF.

The growth, removals, and mortality attributes are also in equal proportion to area for the region. In

individual States exceptions are Oklahoma and Texas. Oklahoma has substantially higher hardwood sawtimber removals than expected. Mortality for hardwood sawtimber in Texas is also slightly higher than expected.

THE NIPF OWNER

Tables 11–18 illustrate the distribution of the Midsouth's private landowners and the acres they own by several owner characteristics frequently used to describe NIPFs. The acreage totals in these tables are not directly comparable to those in tables 1–10 because they were computed differently and they pertain to all private owners including forest industry. However, if the 28.6 million acres owned by the "other" category in table 11 are subtracted from the 88.6-million-acre total, the remaining 60 million acres is close to the 68.3 million acres owned by farmers and miscellaneous categories included in tables 1–10.

Accurate estimates of the actual number of private owners (or "ownership units", as used here) are limited by the economics of sample size. The estimates in tables 11–18 are no exception, a point reflected in the large sampling errors shown in table 19. Consequently, these estimates must be used with caution. The distribution of acres among landowner attributes is more important than the distribution of ownership units from the standpoint of describing those owners who hold large proportions of the timberland. As shown in table 19, acreage estimates are much more accurate than owner estimates. Consequently, most of the emphasis here is on the acreage distributions.

Types of Ownership

Excluding the "other" category, the largest proportions of the Midsouth's private timberland are owned by sole proprietors, families, and family partnerships—in that order (table 11 and fig. 12). This ownership pattern exists in each of the States except Louisiana, where family partners own more land than families, and in Oklahoma and Tennessee, where family ownerships are dominant. Nonfamily partnerships and family corporations own relatively small proportions of the timberland in each State.

The "other" category includes all corporations (except family corporations), noncorporate sport and recreation clubs, and undivided estates (Birch, et al., 1982). In the Midsouth, the bulk of these acres is owned by forest industries. As figure 12 indicates, this "other" category of ownership is dominant in Arkansas, Louisiana, and Texas.

Occupation of Owners

Farmers own the largest proportion of private timberland in the United States—over 16 percent (Birch,

et al., 1982). In the Midsouth, this distinction belongs to retired people who own more than 17 percent of the private acres (table 12 and fig. 13). Farmers are third among the occupational categories with 13 percent, behind white collar workers who own nearly 15 percent. Retired people also own the largest share of timberland acres in each State except Arkansas and Oklahoma. White collar workers own larger shares in these two States.

The landowner estimates in table 12 indicate that retired people constitute by far the largest number of landowners as well—nearly 34 percent. Blue collar workers are a distant second (21 percent) while farmers comprise only about 9 percent of the owners. When the estimated number of owners in each occupational category is compared with the acres owned by the category, we find that farmers own an average of nearly 84 acres each, white collar workers own about 44 acres each, blue collar workers own about 26 acres each, and retired people own nearly 29 acres each.

An interesting side issue of the occupational distribution is the accuracy of the "farmer" occupational label. In the nationwide survey, timberland owners who identified themselves as farmers owned 11.5 million acres of timberland in the Midsouth (table 12). However, timberland owners placed in the "farmer" category during the State-by-State FIA forest survey own an estimated 19.3 million acres. This discrepancy, once again, makes the point that the "farmer" category, however defined, should be interpreted with caution.

Age of Owners

Individuals 65 years and older own more than 22 percent of the Midsouth's private timberland acres—nearly 20 million acres (table 13 and fig. 14). An estimated 528 thousand owners are in this age category—one out of three private owners; so each owner has an average of nearly 38 acres of timberland. In Alabama, Mississippi, and Tennessee combined, this age group owns more than one-fourth of the private timberland, a total of 12.7 million acres. This ownership pattern has important implications because it is reasonable to assume that title to many of these forest acres will transfer to new owners within the next 5–10 years. Regardless of how much we know about the characteristics, management activities, and objectives of current owners such information quickly becomes obsolete when large acreages change hands.

At the other age extreme, individuals under 35 own less than 3 percent of the Midsouth's private timberland, and their average-sized holding is only 18 acres. Even though larger proportions of land are owned by these individuals in Oklahoma (10 percent) and Arkansas (5 percent), the area they own in those two States is only about 1.2 million acres. The significantly larger proportion of land owned by individuals

between the ages of 35 and 49 (13 percent in the Midsouth) may indicate the ages when most individuals begin inheriting timberland or begin acquiring it for various purposes.

Sex and Race of Owners

The private timberland owners in the Midsouth are overwhelmingly white males. Males own more than 42 million of the nearly 52 million noncorporate acres—and whites own nearly 50 million of these acres—96 percent (table 14 and 15). In the Midsouth, female ownership is largest in Alabama where women own nearly 2.9 million acres—21 percent of the nearly 13 million noncorporate acres. Blacks own less than 1 million acres in any State except Mississippi; they own only about 2.9 million acres across the Midsouth. Oklahoma is the only State with significant acreage owned by other than the white and black races; others (primarily American Indians) own 390 thousand acres there and 450 thousand acres across the Midsouth.

Not only is the total timberland acreage owned by females and blacks relatively small, but the average acreage per ownership is quite low. Females own an average of about 30 acres each in the region, and the average black ownership is only slightly more than 17 acres. These averages contrast with the 41.5 acres and 41 acres owned by each male and white owner, respectively.

Education

Nearly equal amounts of private timberland in the Midsouth are owned by individuals who have eight years or less of formal education, high school graduates, and college graduates (table 16 and fig. 15). This tri-modal distribution is evident in most of the States. The most obvious exception is in Tennessee where nearly 23 percent of the private timberland is owned by individuals with no more than a junior high school education.

When the acres owned are divided by the estimated number of owners in the three major education categories, the picture changes. Junior high “graduates” own an average of 25 acres each, high school graduates own 37 acres each, and college graduates own 55 acres each.

Owner’s Residence in Relation to Timberland

More than 54 percent of the private timberland in the Midsouth belongs to owners who live or, in the case of corporations, have headquarters in the county where at least a portion of their timberland is located

(table 17 and fig. 16). Another 20 percent of the land belongs to owners living in the same State, and about 16 percent belongs to out-of-State owners. The proportion of land owned by “same county” residents ranges from 38 percent in Louisiana to nearly 72 percent in Tennessee. In all States except Arkansas, Louisiana, and Texas the rate is about 50 percent. Louisiana and Oklahoma contain relatively large acreages owned by residents of other States or countries.

Even though “same county” residents own a majority of the timberland, their average ownership is significantly smaller than that of “absentee” owners. The averages are 38 acres for “same county” owners, 149 acres for “same state” owners, and 190 acres for “different state” owners. The inclusion of corporations, which tend to be headquartered in metropolitan areas, accounts for some of the difference in averages.

Size of Holding

The vast majority of individual owners of timberland own very small tracts. The national survey found that more than 5.5 million owners—71 percent of the estimated total—have tracts containing less than 10 acres of timberland (Birch, et al., 1982). In the Midsouth 1 million such owners collectively own only 2 percent of private timberland (table 18 and fig. 17). Timber production potential is quite low on these 2 million scattered acres.

The next two size categories (10–49 acres and 50–99 acres) are more problematic in terms of timber management potential. An estimated 400 thousand individuals own these 15.5 million acres, an average of less than 40 acres per owner. Among the States, Mississippi typifies the region very closely. There, an estimated 65 thousand own 2.5 million acres in the 10–49 and 50–99 acre categories. If these owners were evenly distributed over the State’s 82 counties, which certainly they are not, there would be nearly 800 per county. Just making contact with this many owners would strain the service forestry sector—public and private—in that State.

For the 100–499-acre size category, the picture changes dramatically. This category includes about one-half of the non-corporate acres (nearly 30 percent of all privately owned land), but only about 9 percent of the owners—some 136 thousand. The pattern is the same in practically every State. The data in table 12 indicate that about 52 million acres are in the private, individual category in the Midsouth. If we add the acres in the size categories in table 18, we find that nearly 44 million acres are included in the first four categories (up to the 499-acre size category). We can conclude, then, that only about 8 million individually owned acres are in ownership units larger than 500 acres.

CONCLUSIONS

Nonindustrial private forests and owners are extremely diverse regardless of the dimensions used to describe them; consequently, generalizations for large areas and populations have limited use beyond planning general strategy and policy for these forests and owners. With that note of caution, we offer the following conclusions from this analysis of the Midsouth NIPF's and owners.

The condition of the nonindustrial private forest reflects the general neglect of its owners to practice intensive forest management. Poor stocking and low volumes-per-acre suggest that many NIPF owners are doing little to improve the status of their stands. The failure of owners to regenerate pine stands following harvest is well documented (Fecso et al., 1982), and the relatively small areas in pine plantations and natural pine along with a disproportionately large area of upland hardwoods illustrate that failure here. On the other hand, NIPF owners have near their proportionate share of seedling/sapling and poletimber areas, but their small proportion of sawtimber areas and volume may indicate that timber is being harvested before it is mature.

Growth, removals, and mortality do not appear to be problems in NIPFs. Given the proportional distribution of site classes and the room to grow in poorly stocked stands, radial growth is occurring at about the expected rate.

The advanced age and retired status of the owners of a large portion of NIPF land in the Midsouth may have important implications for the future management and productivity of the forests. A recent study in Mississippi indicated that a major ownership objective of individuals 65 years of age and older was to pass the land to their heirs (Doolittle et al., 1986). These owners often expressed a reluctance to invest in improvements because they were unlikely to see immediate results; leaving the timberland as it is appeared to be a more important consideration. More intensive study is needed of the nearly 20 million acres held by these senior citizens.

From a practical point of view, approximately 2,000,000 acres of small-tract timberland should not be considered a contributor to timber production in the Midsouth. This land does make an important contribution to the "green belt" in the form of aesthetics, wildlife protection, and ownership enjoyment.

Tracts from 10–100 acre-sized stands won't contribute heavily because of the difficulty of reaching and advising the 400 thousand owners. That, coupled with the economics of harvesting such small areas, puts these areas in doubt as contributors to the timber supply. In all likelihood, these areas will be cut when the opportunity arises with little or no management

input regarding rotation, thinning, harvesting, and regeneration.

If there is to be a concentration of effort to improve the management and timber production on NIPF land, the approximately 26 million acres in ownership units of 100 to 500 acres would appear to be the logical place to begin. The number of owners of these acres is not unmanageable from a service forestry standpoint, and improvement on their lands would make a dramatic change in the overall NIPF picture.

Finally, recent changes in the tax law may have a significant impact on the NIPF resource in future years. The Tax Reform Act of 1986 has eliminated two important tax benefits to NIPF owners: the capital gains tax and income averaging.

Beginning January 1, 1987, capital gains will be taxed as ordinary income up to a maximum 28 percent. This will mean a substantial increase in taxes for the small timber producer.

NIPF owners often sell their timber and receive all income in one taxable year. Income averaging spreads this income over a three-year period to reduce the tax burden. Beginning January 1, 1987, income averaging will not be allowed.

Still allowed under the new tax law are amortization and tax credits for reforestation expenses, and capitalization of costs. However, even with the retention of these two tax features, incentive is likely to decline for NIPF owners to actively pursue and invoke programs to manage their timberland because of the loss of capital gains and income averaging. It remains to be seen what impact this will have on the NIPF contribution to the timber inventory.

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Appendix

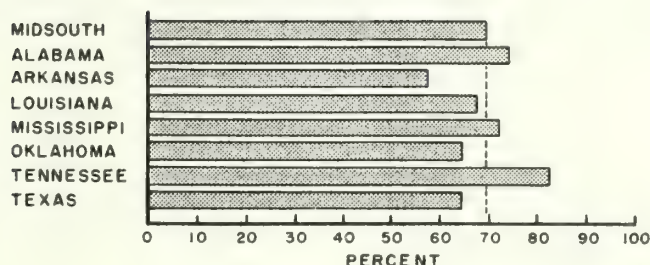


Figure 3.—Proportion of total timberland owned by private nonindustrial owners, Midsouth States and region.

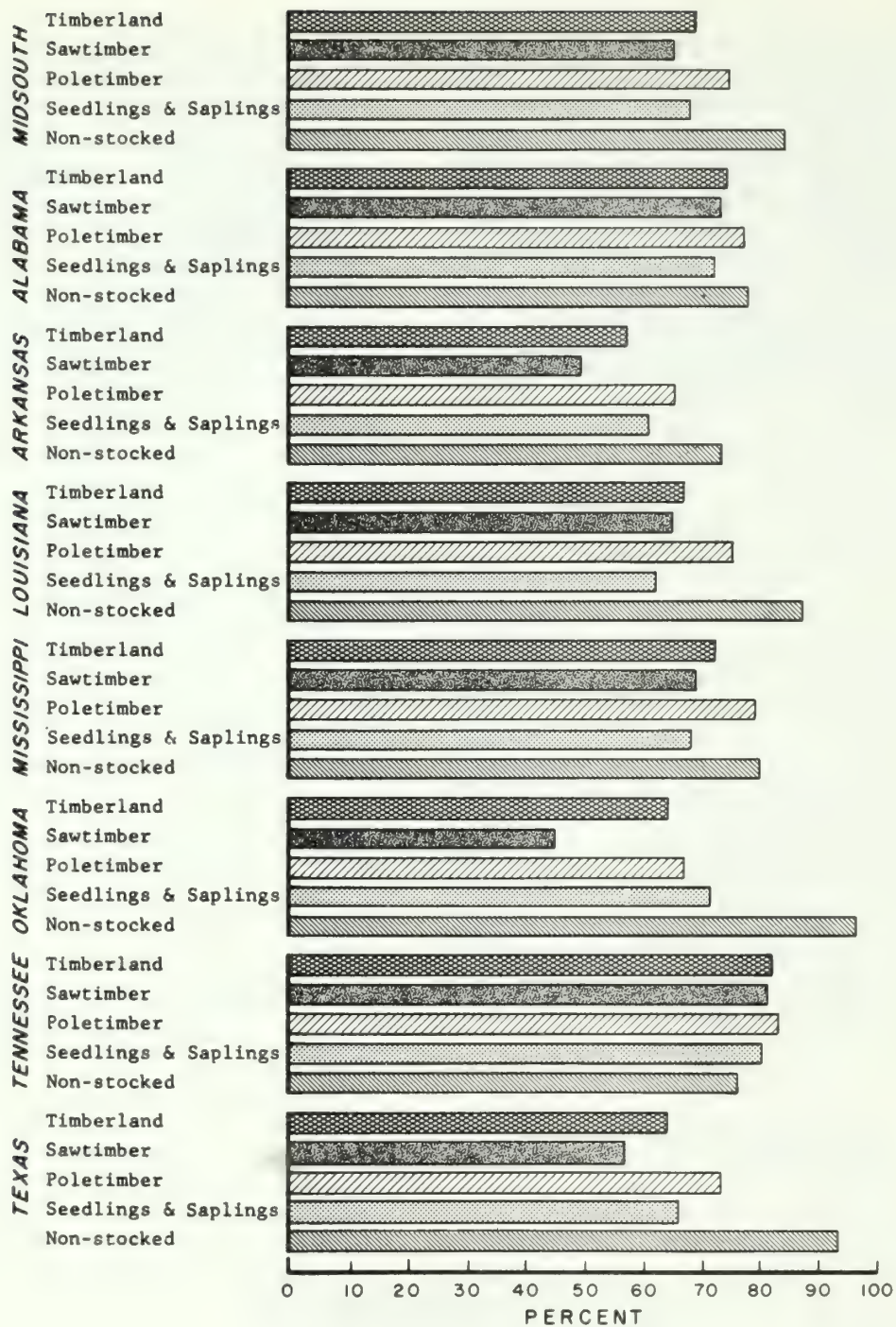


Figure 4.—Proportion of total timberland and total stand-size class area in NIPF ownership, Mid-south States and region.

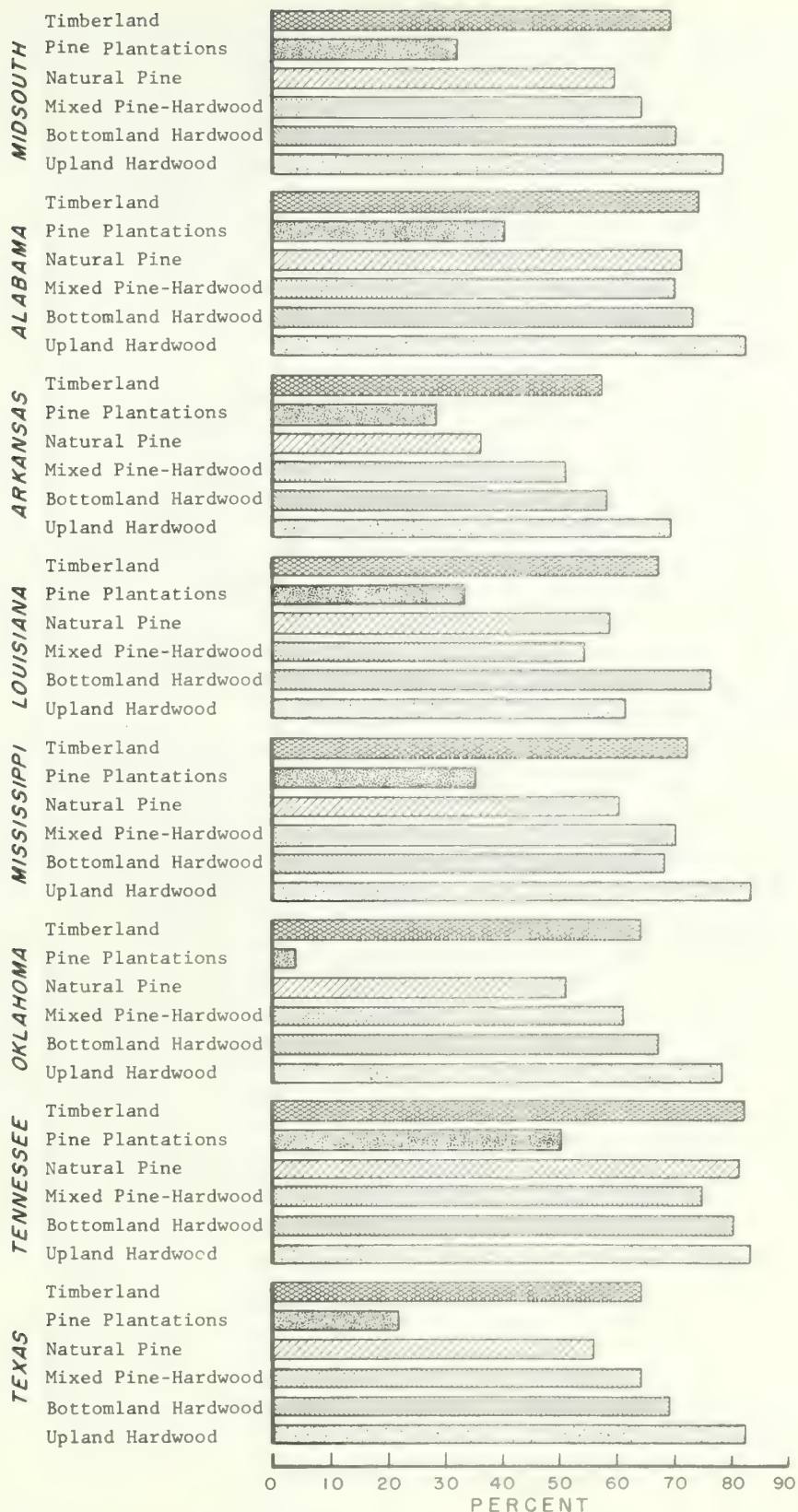


Figure 5.—Proportion of total timberland and total forest management type area in NIPF ownership, Midsouth States and region.

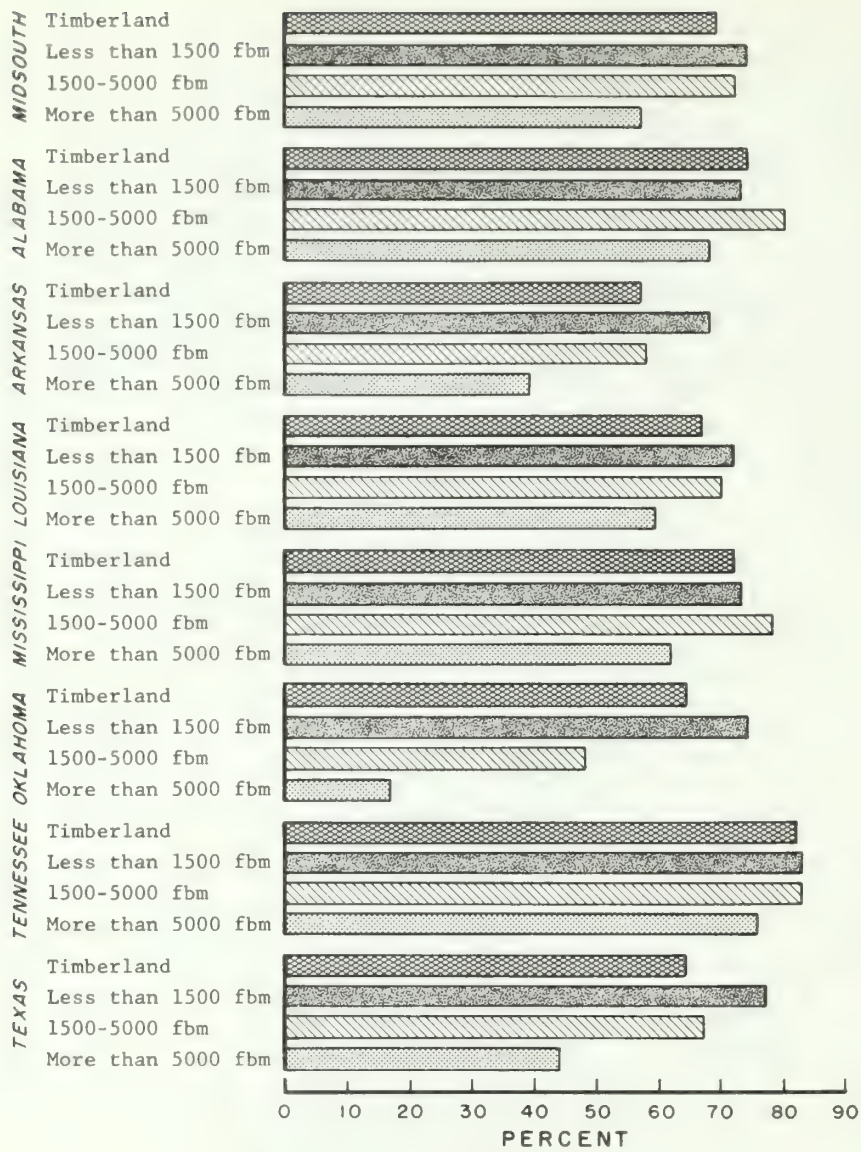


Figure 6.—Proportion of total timberland and total stand volume per acre in NIPF ownership, Midsouth States and region.

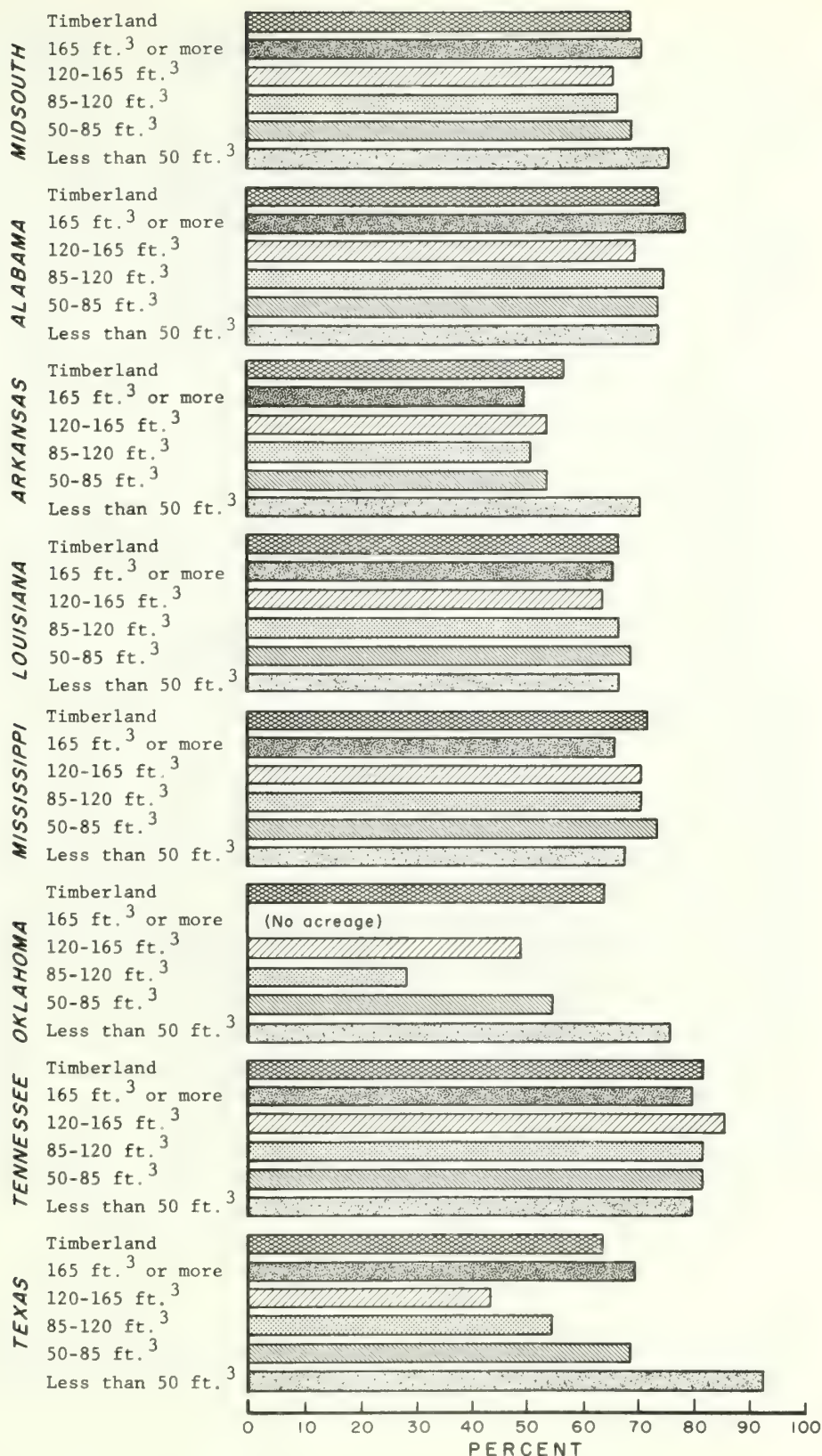


Figure 7.—Proportion of total timberland and total site-class area in NIPF ownership, Midsouth States and region.

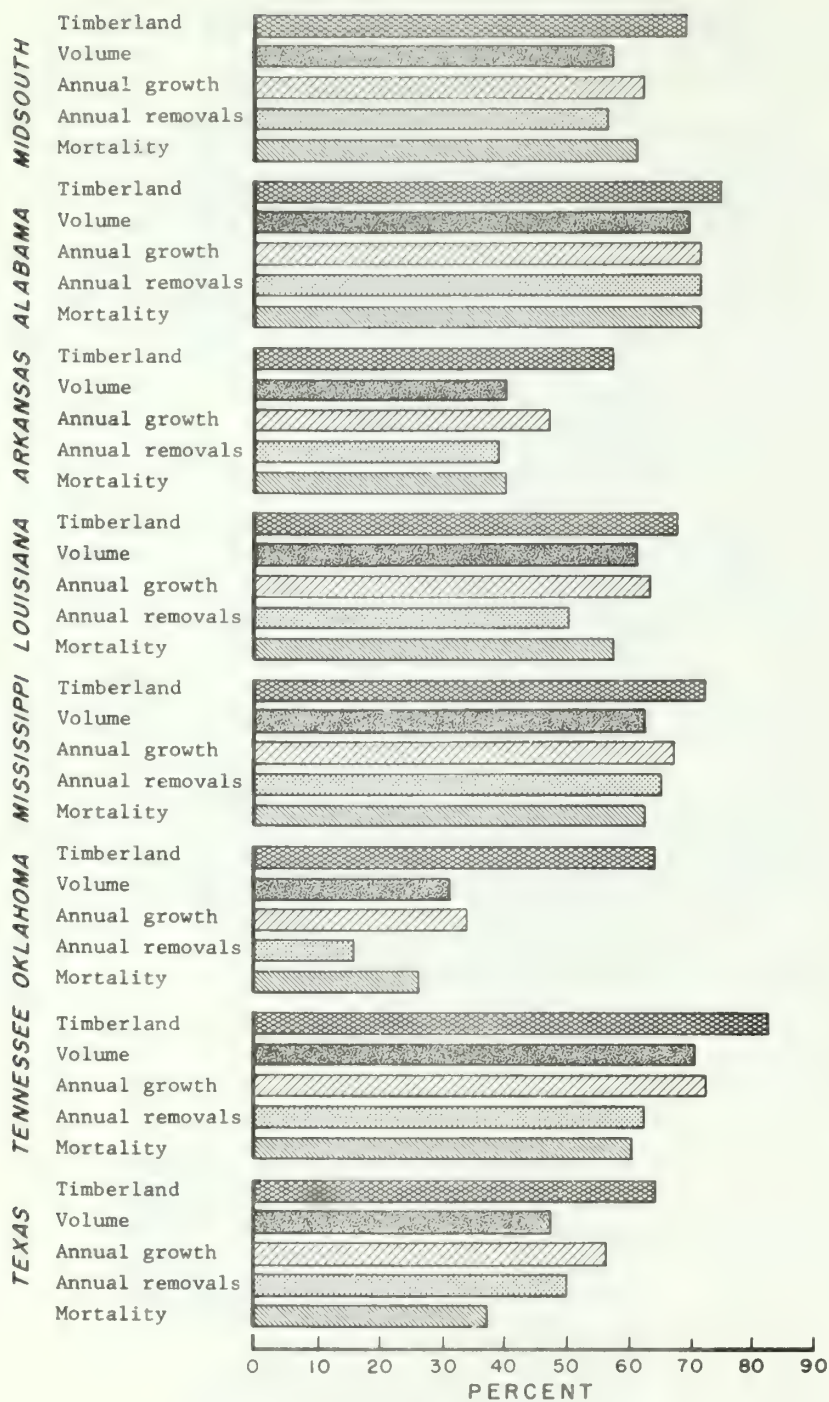


Figure 8.—Proportion of total timberland and total softwood growing-stock volume, net annual growth, annual removals, and mortality on NIPF land, Midsouth States and region.

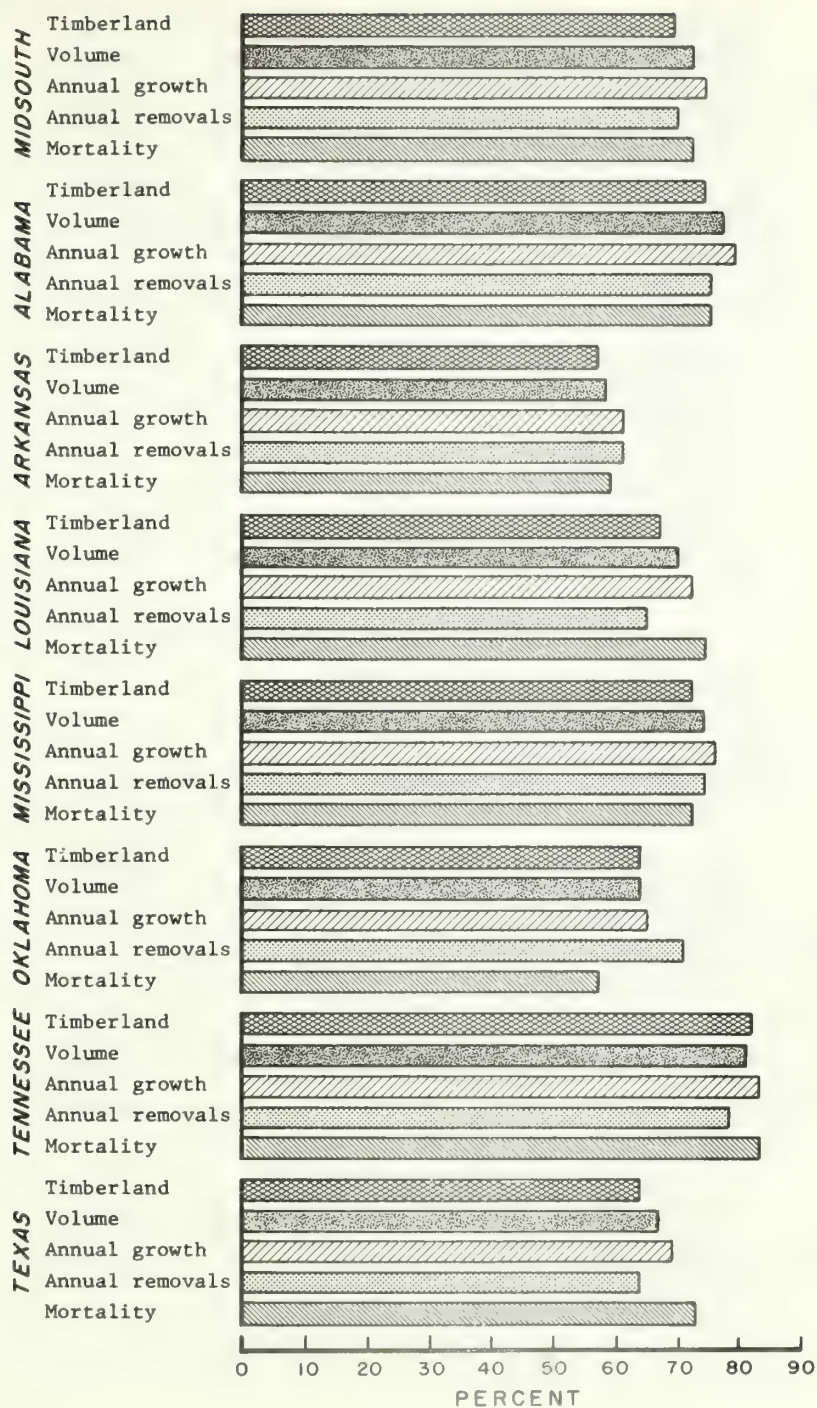


Figure 9.—Proportion of total timberland and total hardwood growing-stock volume, net annual growth, annual removals, and mortality on NIPF land, Midsouth States and region.

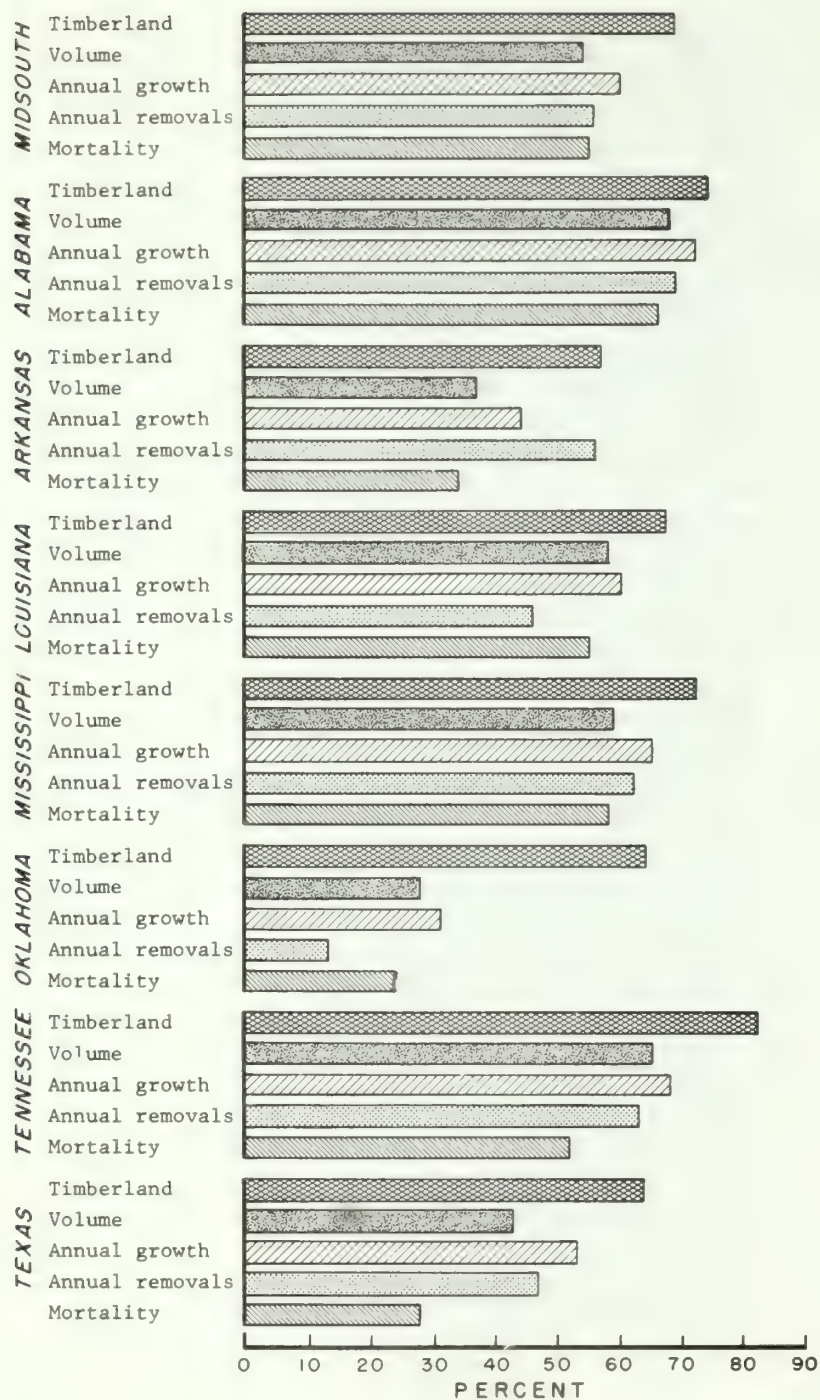


Figure 10.—Proportion of total timberland and total softwood sawtimber volume, net annual growth, annual removals, and mortality on NIPF land, Midsouth States and region.

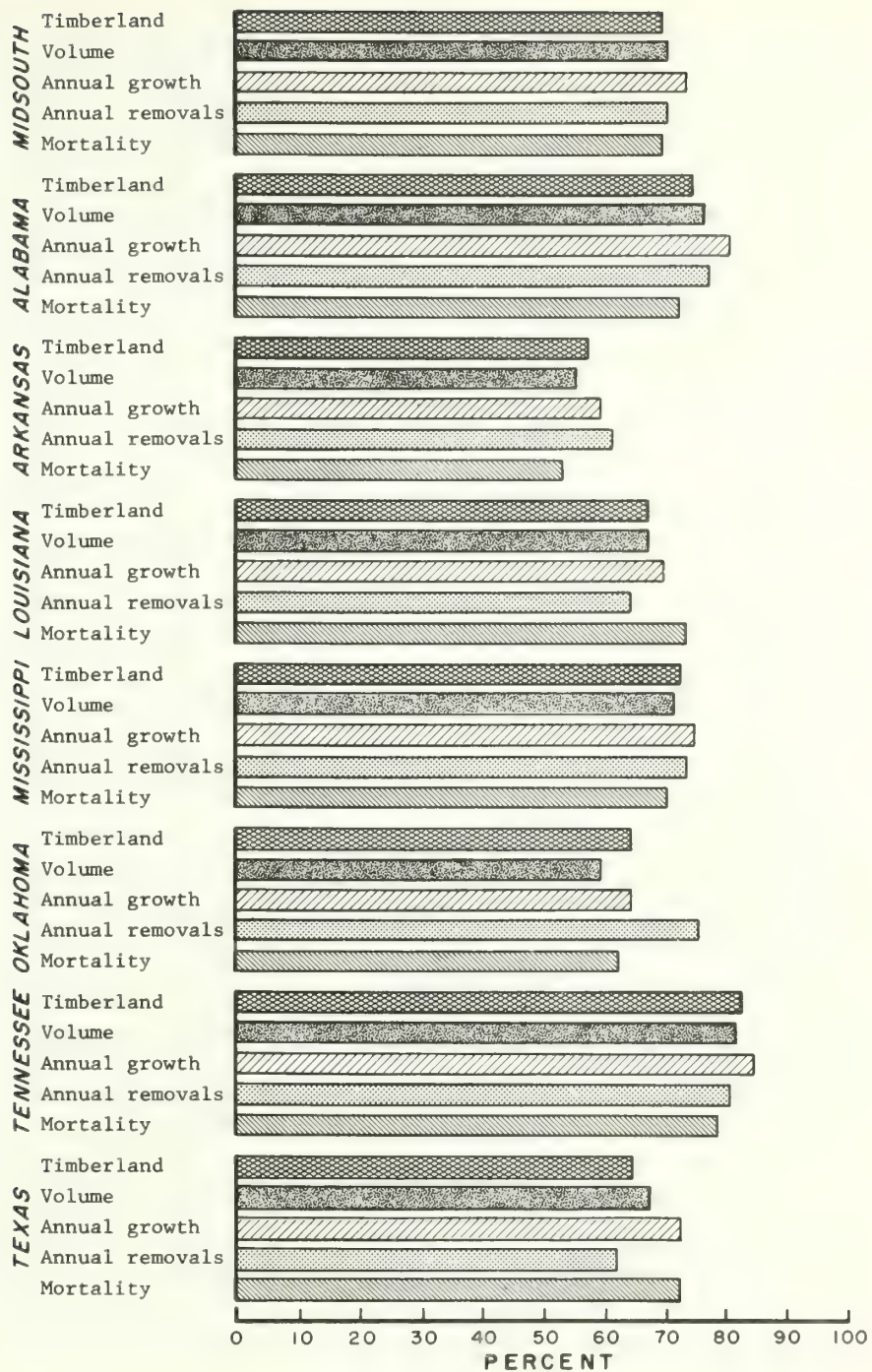


Figure 11.—Proportion of total timberland and total hardwood sawtimber volume, net annual growth, annual removals, and mortality on NIPF land, Midsouth States and region.

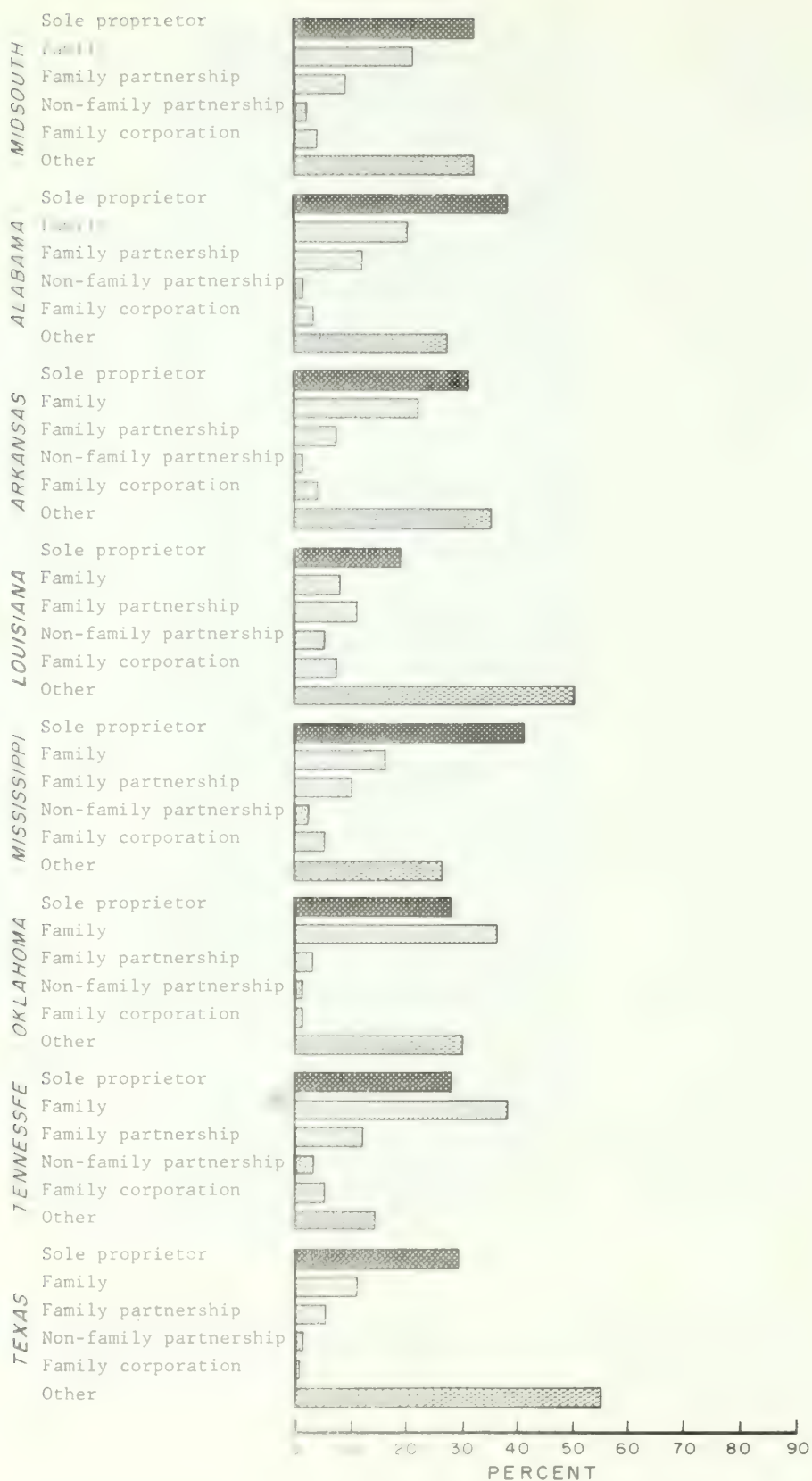


Figure 12.—Distribution of privately owned forest acres by type of ownership, Midsouth States and region, 1978.

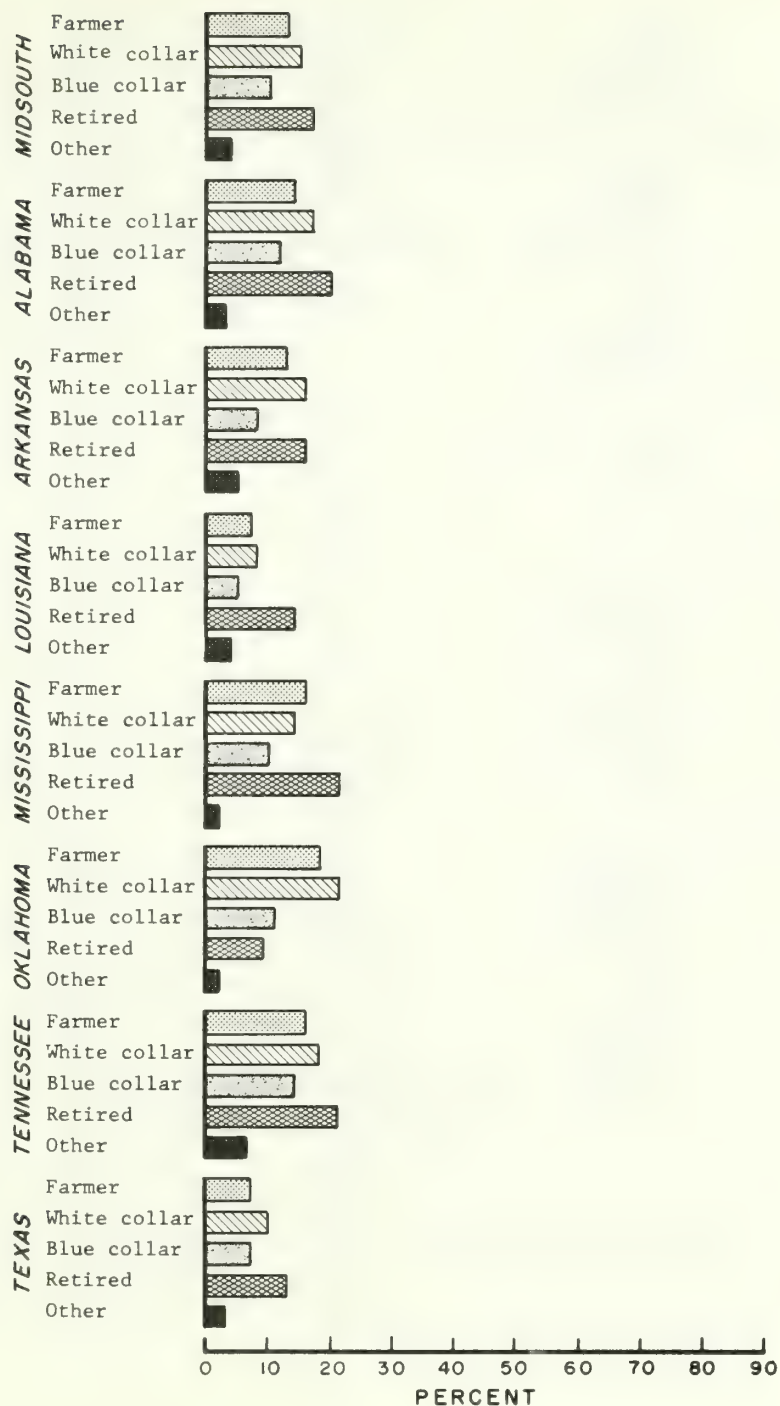


Figure 13.—Distribution of privately owned forest acres by owner's occupation, Midsouth States and region, 1978.

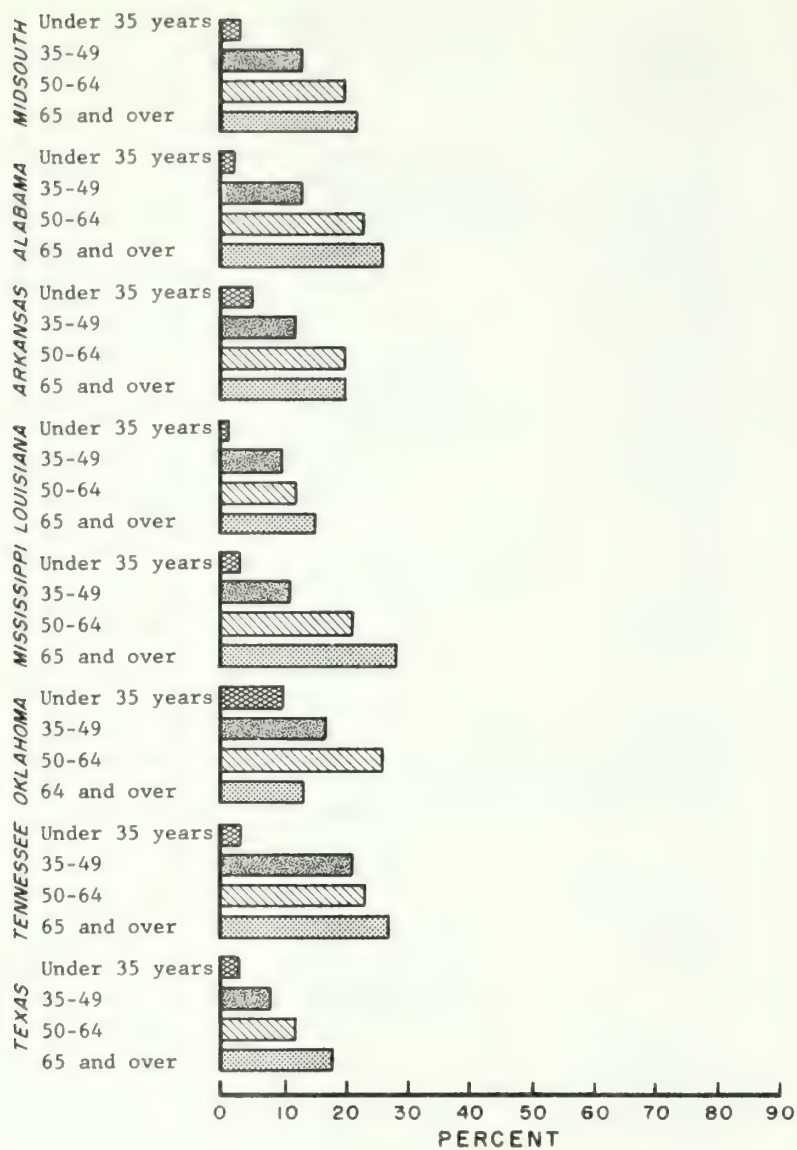


Figure 14.—Distribution of privately owned forest acres by owner's age, Midsouth States and region, 1978.

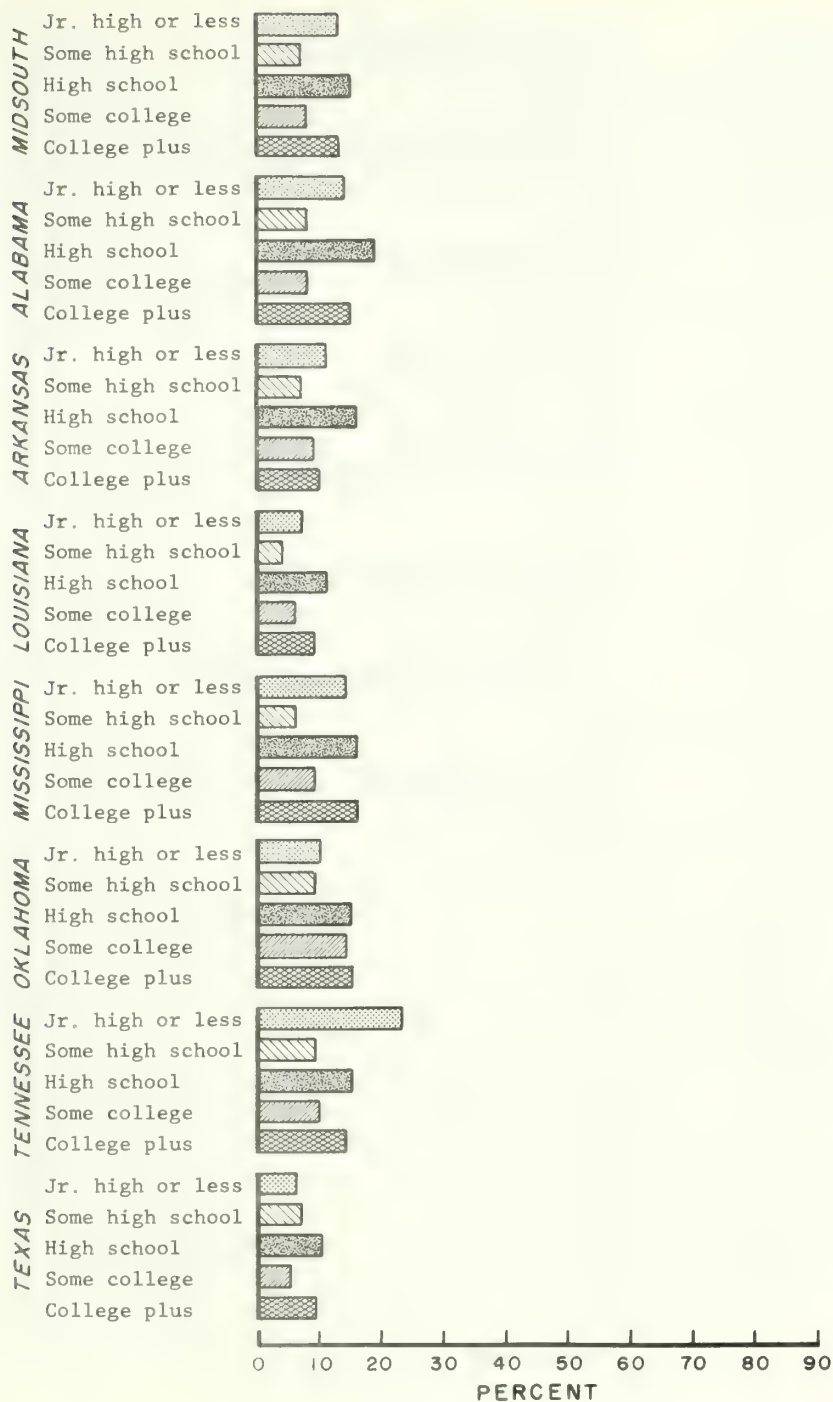


Figure 15.—Distribution of privately owned forest acres by owner's education, Midsouth States and region.

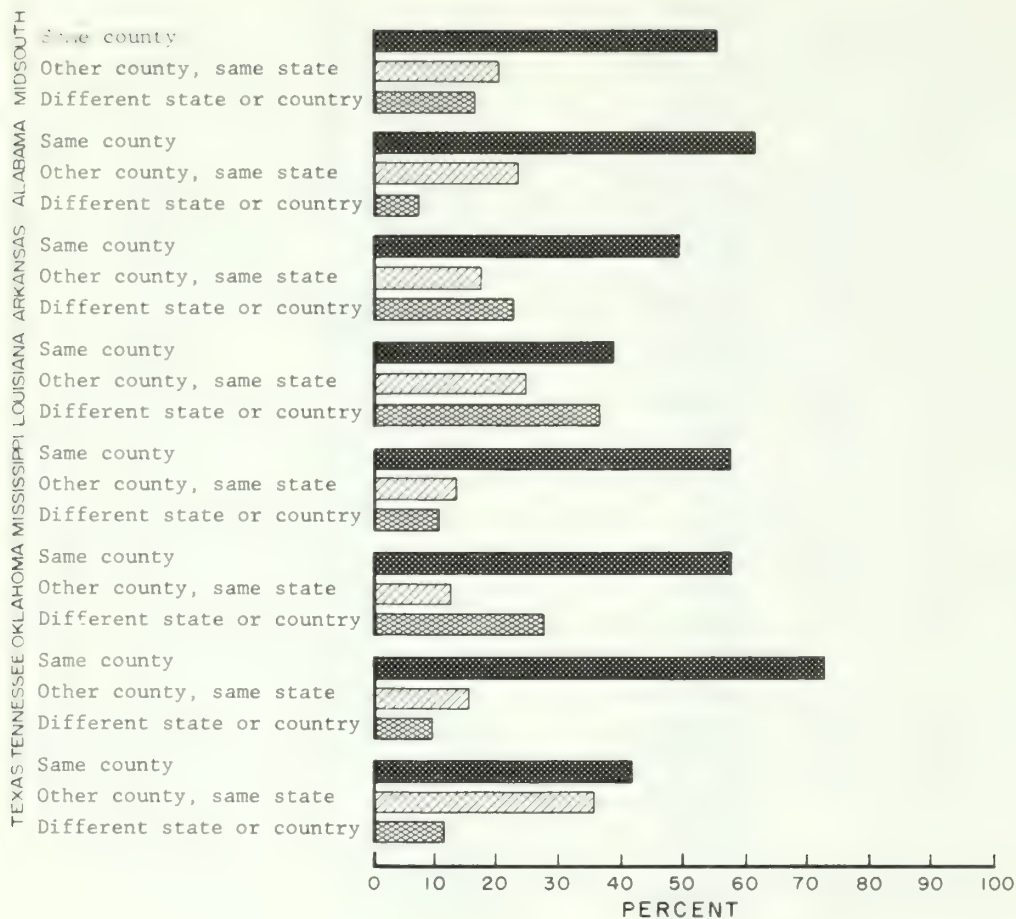


Figure 16.—Distribution of privately owned forest acres by owner's residence, MidSouth States and region, 1978.

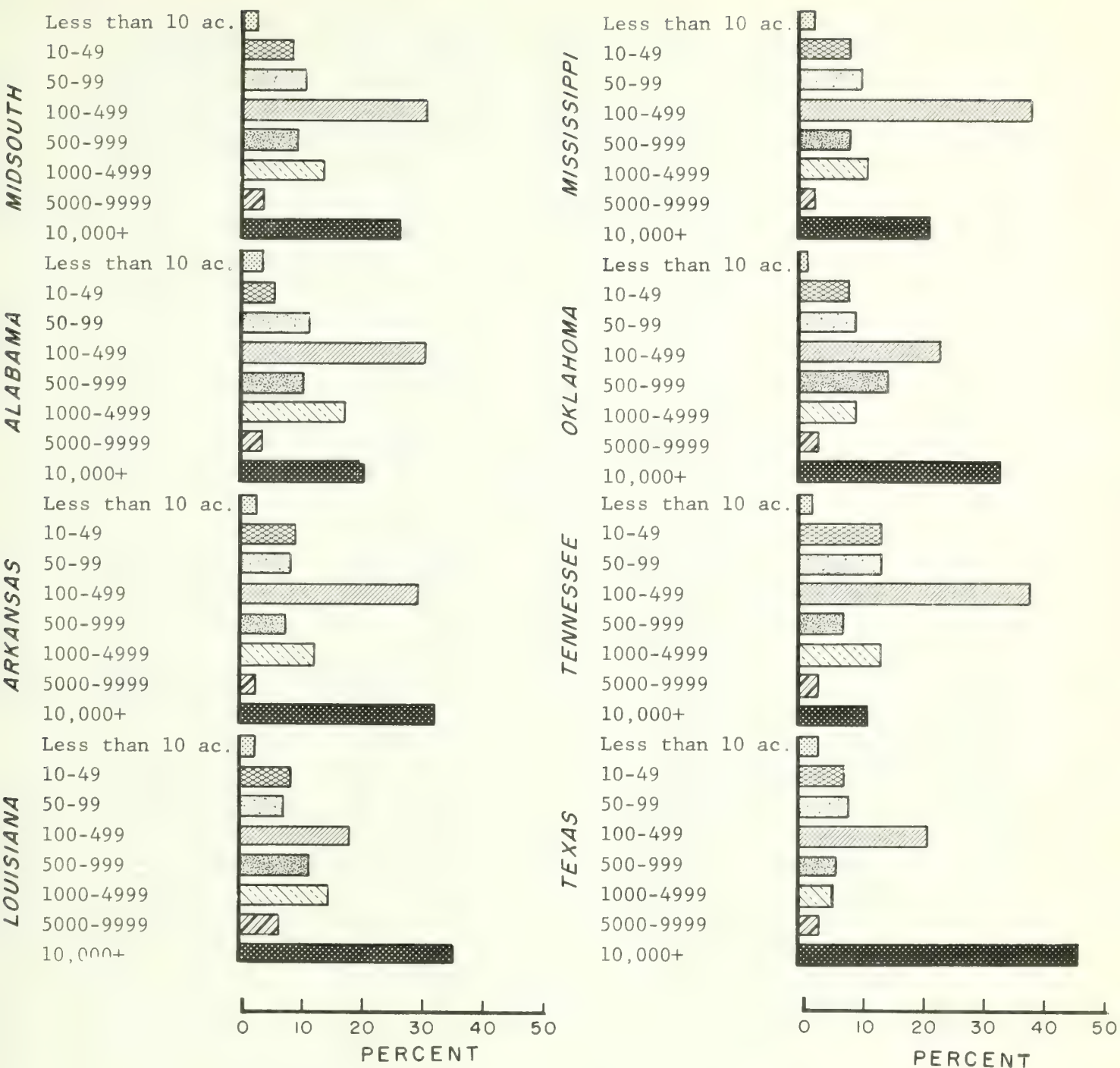


Figure 17.—Distribution of privately owned forest acres by size of holding in Midsouth States and region, 1978.

Table 1.—Area of timberland, all ownerships and nonindustrial private ownership, by State, Midsouth region

State	All ownerships	NIPF	Percent NIPF ¹
----- Thousand acres -----			
Alabama (1982) ²	21,658.8	16,040.4	74.1
Arkansas (1978)	16,615.6	9,466.0	57.0
Louisiana (1974)	14,526.6	9,743.2	67.1
Mississippi (1977)	16,504.3	11,831.8	71.7
Oklahoma (1976)	4,323.4	2,769.5	64.1
Tennessee (1980)	12,879.0	10,496.4	81.5
Texas (1975)	12,512.5	7,964.1	63.6
Midsouth	99,020.2	68,311.4	69.0

¹NIPF acres divided by total acres × 100.

²Year in which the most recent forest survey was completed.

Table 2.—Area of timberland, all ownerships and NIPF ownership, by stand-size class and by State, Midsouth region

State	Sawtimber			Poletimber			Seedlings and saplings				Non-stocked		
	All ownerships	NIPF	Percent NIPF	All ownerships	NIPF	Percent NIPF	All ownerships	NIPF	Percent NIPF	All ownerships	NIPF	Percent NIPF	
----- Thousand acres -----													
Alabama	7,617.7	5,571.9	73.1	6,948.8	5,373.2	77.3	6,723.3	4,808.4	71.5	369.0	287.1	77.8	
Arkansas	6,983.5	3,387.7	48.5	5,472.3	3,539.2	64.7	4,046.7	2,456.6	60.7	113.1	82.5	72.9	
Louisiana	7,880.5	5,112.9	64.9	3,409.8	2,545.4	74.6	2,911.1	1,803.2	61.9	325.2	281.7	86.6	
Mississippi	7,421.7	5,104.9	68.8	4,806.7	3,809.1	79.2	4,121.0	2,793.9	67.8	154.9	123.9	80.0	
Oklahoma	1,028.6	460.1	44.7	1,483.1	988.0	66.6	1,642.7	1,158.7	70.5	169.0	162.7	96.3	
Tennessee	4,923.6	3,968.8	80.6	5,229.6	4,348.0	83.1	2,672.2	2,138.6	80.0	53.8	41.0	76.5	
Texas	6,456.9	3,701.4	57.3	3,202.3	2,326.8	72.7	2,687.6	1,782.7	66.3	165.7	153.2	92.5	
Midsouth	42,312.5	27,307.7	64.5	30,552.6	22,929.7	75.0	24,804.6	16,942.1	68.3	1,350.5	1,132.1	83.8	

Table 4.—Area of timberland, all ownerships and NIPF ownership, by forest type and by State, Midsouth region

State	Forest type											
	Longleaf-slash pine			Loblolly-shortleaf pine			Oak-pine			Oak-hickory		
	All	NIPF	Percent	All	NIPF	Percent	All	NIPF	Percent	All	NIPF	Percent
	ownerships		NIPF	ownerships		NIPF	ownerships		NIPF	ownerships		NIPF
Thousand acres												
Alabama	1,482.7	801.9	54.1	5,853.7	4,072.0	69.6	4,562.9	3,306.9	72.5	7,275.8	5,957.5	81.9
Arkansas	.....	.....	.....	4,277.0	1,613.9	37.7	2,966.6	1,527.2	51.5	6,537.5	4,623.4	70.7
Louisiana	1,022.6	563.7	55.1	4,073.4	2,337.4	57.4	2,207.6	1,393.6	63.1	1,725.5	1,185.7	68.7
Mississippi	1,051.5	449.4	42.7	4,250.2	2,826.0	66.5	3,451.5	2,465.4	71.4	4,239.6	3,502.7	82.6
Oklahoma	.....	.....	.....	847.3	265.4	31.3	693.1	337.1	48.6	2,357.2	1,870.5	79.4
Tennessee	.....	.....	.....	1,058.3	758.3	71.7	1,007.6	699.6	69.4	9,312.6	7,809.3	83.9
Texas	258.8	67.0	25.9	4,502.9	2,352.2	52.2	2,550.5	1,525.1	59.8	3,018.7	2,444.8	81.0
Midsouth	3,815.6	1,882.0	49.3	24,863.1	14,225.2	57.2	17,439.8	11,254.9	64.5	34,466.9	27,393.9	79.5

	Forest type											
	Oak-gum-cypress			Elm-ash-cottonwood			Other					
	All	NIPF	Percent	All	NIPF	Percent	All	NIPF	Percent	All	NIPF	Percent
	ownerships		NIPF	ownerships		NIPF	ownerships		NIPF	ownerships		NIPF
Thousand acres												
Alabama	2,373.5	1,814.8	76.5	74.0	63.1	85.3	36.2	24.3	67.1			
Arkansas	2,628.0	1,569.4	59.7	206.5	132.1	64.0	.....	.....	.....			
Louisiana	4,956.6	3,840.5	77.5	540.9	422.3	78.1	.....	.....	.....			
Mississippi	3,274.1	2,451.1	74.9	237.4	137.2	57.8	.....	.....	.....			
Oklahoma	296.3	217.1	73.3	129.5	79.4	61.3	.....	.....	.....			
Tennessee	679.7	551.4	81.1	99.2	72.1	72.7	721.6 ¹	618.7	85.7			
Texas	1,952.7	1,374.0	70.4	228.9	201.0	87.8	.....	.....	.....			
Midsouth	16,160.9	11,818.3	73.1	1,516.4	1,107.2	73.0	757.8	643.0	84.9			

¹Includes 651.3 thousand acres of cedar of which 580.9 thousand acres, 89.2 percent, is NIPF.

Table 5.—Area of timberland, all ownerships and NIPF ownership, by stand volume and by State, Midsouth region

Stand volume per acre									
State	Less than 1500 fbm			1500-5000 fbm			More than 5000 fbm		
	All	Percent	NIPF	All	Percent	NIPF	All	Percent	NIPF
	ownerships	NIPF		ownerships	NIPF		ownerships	NIPF	
	----- Thousand acres -----								
Alabama	9,186.8	6,662.0	72.5	7,163.5	5,752.8	80.3	5,308.4	3,625.6	68.3
Arkansas	6,419.6	4,366.7	68.0	5,813.9	3,384.9	58.2	4,382.1	1,714.4	39.1
Louisiana	4,394.5	3,165.5	72.0	5,349.9	3,769.0	70.4	4,782.2	2,808.7	58.7
Mississippi	6,032.0	4,425.2	73.4	6,013.7	4,663.9	77.6	4,458.6	2,742.7	61.5
Oklahoma	3,026.6	2,230.3	73.7	1,047.6	497.8	47.5	249.2	41.4	16.7
Tennessee	5,088.8	4,239.6	83.3	5,198.3	4,289.9	82.5	2,591.9	1,966.9	75.9
Texas	4,193.7	3,214.7	76.7	4,759.5	3,164.3	66.5	3,559.3	1,585.1	44.5
Midsouth	38,342.0	28,304.0	73.8	35,346.4	25,522.6	72.2	25,331.7	14,484.8	57.2

Table 6.—Area of timberland, all ownerships and NIPF ownership, by site class and by State, Midsouth region

State	Site class														
	165 ft. ³ or more			120-165 ft. ³			85-120 ft. ³			50-85 ft. ³			Less than 50 ft. ³		
	All	Percent	NIPF	All	Percent	NIPF	All	Percent	NIPF	All	Percent	NIPF	All	Percent	NIPF
	ownerships	NIPF		ownerships	NIPF		ownerships	NIPF		ownerships	NIPF		ownerships	NIPF		ownerships	NIPF
----- Thousand acres -----															
Alabama	974.3	770.9	79.1	3,785.4	2,648.7	70.0	8,468.7	6,367.5	75.2	7,263.8	5,393.0	74.2	1,166.5	860.3	73.8
Arkansas	235.6	116.8	49.6	1,303.1	708.2	54.3	4,636.9	2,350.0	50.7	6,509.5	3,495.0	53.7	3,930.5	2,796.0	71.1
Louisiana	419.8	275.6	65.7	1,889.3	1,204.7	63.8	5,406.4	3,594.2	66.5	6,088.4	4,183.1	68.7	722.7	485.6	67.2
Mississippi	507.8	336.9	66.3	2,542.6	1,802.3	70.9	8,230.2	5,873.4	71.4	4,877.8	3,583.5	73.5	345.9	235.7	68.1
Oklahoma	5.5	.....	.....	33.1	16.1	48.6	230.4	63.3	27.5	1,879.1	1,027.6	54.7	2,175.3	1,662.5	76.4
Tennessee	216.8	174.0	80.3	717.1	614.8	85.7	3,119.7	2,546.0	81.6	6,285.9	5,140.9	81.8	2,539.5	2,020.8	79.6
Texas	133.3	93.4	70.1	1,071.4	475.5	44.4	4,679.9	2,557.2	54.6	5,639.9	3,915.5	69.4	988.0	922.5	93.4
Midsouth	2,493.1	1,767.6	70.9	11,342.0	7,470.3	65.9	34,772.2	23,351.6	67.2	38,544.4	26,738.6	69.4	11,868.4	8,983.4	75.7

State	Component											
	Volume			Net annual growth			Annual removals			Mortality		
	All ownerships	NIPF	Percent NIPF	All ownerships	NIPF	Percent NIPF	All ownerships	NIPF	Percent NIPF	All ownerships	NIPF	Percent NIPF
	Million cubic feet											
Alabama	11,655.7	8,017.4	68.8	641.8	457.0	71.2	636.2	448.3	70.5	121.3	86.5	71.3
Arkansas	8,168.0	3,265.6	40.0	423.5	200.8	47.4	404.4	150.4	37.2	27.4	11.0	40.1
Louisiana	9,040.0	5,517.1	61.0	604.1	382.3	63.3	441.2	219.5	49.8	39.6	22.7	57.3
Mississippi	8,929.1	5,575.1	62.4	589.5	392.0	66.5	492.4	321.3	65.3	56.0	34.8	62.1
Oklahoma	1,010.4	316.0	31.3	55.9	18.9	33.8	46.7	7.4	15.8	1.9	0.5	26.3
Tennessee	2,405.5	1,681.6	69.9	96.8	69.5	71.8	37.6	23.2	61.7	14.3	8.6	60.1
Texas	8,161.6	3,844.7	47.1	485.2	270.2	55.7	381.5	192.1	50.4	28.1	10.5	37.4
Midsouth	49,370.3	28,217.5	57.2	2,896.8	1,790.7	61.8	2,440.0	1,362.2	55.8	288.6	174.6	60.5

Table 8.—Hardwood growing-stock volume, net annual growth, annual removals, and mortality, all ownerships and NIPF ownership by State, Midsouth region

State	Component											
	Volume			Net annual growth			Annual removals			Mortality		
	All ownerships	NIPF	Percent NIPF	All ownerships	NIPF	Percent NIPF	All ownerships	NIPF	Percent NIPF	All ownerships	NIPF	Percent NIPF
----- Million cubic feet -----												
Alabama	10,050.5	7,770.2	77.3	344.5	272.0	79.0	218.6	164.7	75.3	83.6	62.9	75.2
Arkansas	9,079.9	5,295.6	58.3	369.1	224.1	60.7	210.3	127.5	60.6	56.1	32.9	58.6
Louisiana	7,657.5	5,342.2	69.8	324.7	234.6	72.3	160.2	104.3	65.1	69.1	51.3	74.2
Mississippi	8,304.6	6,158.3	74.2	423.7	323.8	76.4	241.1	178.1	73.9	65.7	47.4	72.1
Oklahoma	1,051.1	668.4	63.6	60.9	39.6	65.0	16.6	11.8	71.1	7.4	4.2	56.8
Tennessee	10,399.7	8,446.3	81.2	414.6	342.8	82.7	176.0	137.6	78.2	37.4	30.9	82.5
Texas	4,568.7	3,044.1	66.6	236.6	163.4	69.1	99.3	63.6	64.0	22.6	16.5	73.0
Midsouth	51,112.0	36,725.1	71.9	2,174.1	1,600.3	73.6	1,122.1	787.6	70.2	341.9	246.1	72.0

Table 9.—Softwood sawtimber volume, net annual growth, annual removals, and mortality, all ownerships and NIPF ownerships, by State, Midsouth region

State	Component											
	Volume			Net annual growth			Annual removals			Mortality		
	All	NIPF	Percent NIPF	All	NIPF	Percent NIPF	All	NIPF	Percent NIPF	All	NIPF	Percent NIPF
	ownerships			ownerships			ownerships			ownerships		
	Million board feet											
Alabama	44,498.6	30,271.2	68.0	2,901.8	2,080.5	71.7	2,672.9	1,852.1	69.3	334.3	221.9	66.4
Arkansas	34,198.6	12,783.8	36.5	2,083.0	913.6	43.9	1,191.6	667.4	56.0	74.0	25.3	34.2
Louisiana	36,992.7	21,421.7	57.9	2,653.9	1,588.7	59.9	2,135.5	977.8	45.8	133.1	73.0	54.8
Mississippi	35,370.0	20,875.0	59.0	2,705.6	1,767.7	65.3	2,342.6	1,442.2	61.6	172.4	99.8	57.9
Oklahoma	3,575.8	996.7	27.9	242.2	75.1	31.0	222.5	28.8	12.9	5.6	1.3	23.2
Tennessee	7,684.3	4,961.5	64.6	369.3	249.2	67.5	119.0	75.4	63.4	24.8	12.9	52.0
Texas	34,892.0	14,875.1	42.6	2,323.4	1,220.4	52.5	1,831.6	857.1	46.8	103.6	29.2	28.2
Midsouth	197,212.0	106,185.0	53.8	13,279.2	7,895.2	59.5	10,515.7	5,900.8	56.1	847.8	463.4	54.7

Table 10.—Hardwood sawtimber volume, net annual growth, annual removals, and mortality, all ownerships and NIPF ownership, by State, Midsouth region

State	Component											
	Volume			Net annual growth			Annual removals			Mortality		
	All ownerships	NIPF	Percent NIPF	All ownerships	NIPF	Percent NIPF	All ownerships	NIPF	Percent NIPF	All ownerships	NIPF	Percent NIPF
	<i>Million board feet</i>											
Alabama	27,069.8	20,546.2	75.9	1,101.3	876.3	79.6	705.7	543.2	77.0	251.5	182.1	72.4
Arkansas	25,095.7	13,889.7	55.3	1,230.2	729.6	59.3	795.6	485.8	61.1	169.2	90.3	53.4
Louisiana	23,822.7	16,049.9	67.4	1,150.5	795.8	69.2	738.0	470.3	63.7	231.4	168.0	72.6
Mississippi	25,271.6	18,049.9	71.4	1,589.4	1,173.7	73.8	1,036.1	757.7	73.1	206.0	143.6	69.7
Oklahoma	2,490.9	1,466.2	58.9	155.0	99.5	64.2	51.1	38.2	74.8	20.7	12.9	62.3
Tennessee	31,213.0	25,353.1	81.2	1,339.2	1,123.8	83.9	696.9	560.3	80.4	77.0	59.9	77.8
Texas	12,995.5	8,662.6	66.7	805.0	575.6	71.5	476.0	297.2	62.4	67.8	48.7	71.8
Midsouth	147,959.2	104,017.1	70.3	7,370.6	5,374.3	72.9	4,499.4	3,152.7	70.1	1,023.6	705.5	68.9

Table 11.—*Estimated number of private ownership units and acres of timberland owned by type of ownership and by State, Midsouth region, 1978¹*

Type of ownership	Alabama		Arkansas		Louisiana		Mississippi	
	Thousands	Percent	Thousands	Percent	Thousands	Percent	Thousands	Percent
----- Owners -----								
Sole proprietor	323.4	75.4	105.0	34.1	116.4	54.1	106.0	57.4
Family (husband & wife)	87.8	20.5	190.4	61.8	83.6	38.8	28.1	15.2
Family partnership	11.2	2.6	8.9	2.9	7.9	3.7	10.8	5.8
Nonfamily partnership	0.8	0.2	0.2	0.1	0.4	0.2	1.5	0.8
Family corporation	1.1	0.3	1.4	0.5	0.8	0.4	0.1	0.1
Other ²	4.5	1.0	2.2	0.7	6.1	2.8	38.2	20.7
Total	428.8	100.0	308.1	100.0	215.2	100.0	184.7	100.0
----- Acres owned -----								
Sole proprietor	7,413.9	37.5	4,496.5	30.7	2,304.9	19.4	5,760.3	41.1
Family (husband & wife)	3,868.8	19.6	3,284.6	22.4	948.1	8.0	2,288.0	16.3
Family partnership	2,407.7	12.2	1,016.6	6.9	1,251.4	10.5	1,330.0	9.5
Nonfamily partnership	273.1	1.4	115.8	0.8	555.8	4.7	333.3	2.4
Family corporation	540.2	2.7	574.4	3.9	849.4	7.2	697.9	5.0
Other ²	5,251.7	26.6	5,160.3	35.2	5,959.0	50.2	3,605.2	25.7
Total	19,755.4	100.0	14,648.2	100.0	11,868.6	100.0	14,014.7	100.0
	Oklahoma		Tennessee		Texas		Midsouth	
----- Owners -----								
Sole proprietor	21.0	48.6	78.5	35.0	95.9	51.8	846.2	53.2
Family (husband & wife)	20.2	46.8	130.1	58.0	60.1	32.4	600.3	37.8
Family partnership	1.6	3.7	9.2	4.1	17.9	9.7	67.5	4.2
Nonfamily partnership	a	b	3.9	1.7	0.3	0.2	7.1	0.4
Family corporation	a	b	0.7	0.3	a	b	4.1	0.3
Other ²	0.4	0.9	2.1	0.9	11.1	6.0	64.6	4.1
Total	43.2	100.0	224.5	100.0	185.3	100.0	1,589.8	100.0
----- Acres owned -----								
Sole Proprietor	1,524.0	28.4	3,907.1	28.3	2,646.4	28.8	28,053.1	31.7
Family (husband & wife)	1,953.1	36.4	5,240.0	38.0	967.7	10.5	18,550.3	20.9
Family partnership	152.6	2.8	1,658.1	12.0	415.4	4.5	8,231.8	9.3
Nonfamily partnership	52.0	1.0	370.7	2.7	83.6	0.9	1,784.3	2.0
Family corporation	57.4	1.1	654.5	4.7	14.0	0.2	3,387.8	3.8
Other ²	1,633.1	30.4	1,955.2	14.2	5,058.2	55.1	28,622.7	32.3
Total	5,372.2	100.0	13,785.6	100.0	9,185.3	100.0	88,630.0	100.0

¹Percents may not add to 100.0 because of rounding.

²Includes forest industry.

^a - Fewer than 100 owners.

^b - Less than 0.05 percent.

Table 12.—*Estimated number of private ownership units and acres of timberland owned by occupation of owners and by State, Midsouth region, 1978¹*

Type of ownership	Alabama		Arkansas		Louisiana		Mississippi	
	Thousands	Percent	Thousands	Percent	Thousands	Percent	Thousands	Percent
----- Owners -----								
Farmer	39.9	9.3	10.5	3.4	30.0	13.9	12.6	6.8
White collar	88.3	20.6	21.6	7.0	19.9	9.2	19.7	10.7
Blue collar	89.1	20.8	59.4	19.3	65.1	30.3	40.8	22.1
Retired	117.9	27.5	172.0	55.8	82.9	38.5	64.5	34.9
Other	35.5	8.3	12.3	4.0	4.9	2.3	3.2	1.7
Total, individual	370.7	86.5	275.8	89.5	202.8	94.2	140.8	76.2
Corporate, estates, etc.	6.7	1.6	1.0	0.3	6.5	3.0	39.9	21.6
No anwer	51.4	12.0	31.3	10.2	5.9	2.7	4.0	2.2
Total	428.8	100.0	308.1	100.0	215.2	100.0	184.7	100.0
----- Acres owned -----								
Farmer	2,725.1	13.8	1,895.3	12.8	827.7	7.0	2,283.2	16.3
White collar	3,316.4	16.8	2,321.8	15.9	963.4	8.1	2,023.0	14.4
Blue collar	2,265.0	11.5	1,116.1	7.6	588.9	5.0	1,396.8	10.0
Retired	4,013.5	20.3	2,279.7	15.6	1,644.0	13.9	2,960.5	21.1
Other	644.9	3.3	701.4	4.8	420.8	3.5	304.4	2.2
Total, individual	12,964.9	65.6	8,314.3	56.8	4,444.8	37.5	8,967.9	64.0
Corporate, estates, etc.	5,708.1	28.9	5,248.0	35.8	6,641.3	56.0	4,385.9	31.3
No answer	1,082.4	5.5	1,085.9	7.4	782.5	6.6	660.9	4.7
Total	19,755.4	100.0	14,648.2	100.0	11,868.6	100.0	14,014.7	100.0
	Oklahoma		Tennessee		Texas		Midsouth	
----- Owners -----								
Farmer	2.3	5.3	13.5	6.0	28.3	15.3	137.1	8.6
White collar	18.6	43.1	77.5	34.5	54.5	29.4	300.1	18.9
Blue collar	6.6	15.3	47.0	20.9	24.8	13.4	332.8	20.9
Retired	6.7	15.5	43.2	19.2	49.3	26.6	536.5	33.7
Other	7.3	16.9	15.5	6.9	2.3	1.2	81.0	5.1
Total, individual	41.5	96.1	196.7	87.6	159.2	85.9	1,387.5	87.3
Corporate, estates, etc.	1.0	2.3	3.6	1.6	11.7	6.3	70.4	4.4
No answer	0.7	1.6	24.2	10.8	14.4	7.8	131.9	8.3
Total	43.2	100.0	224.5	100.0	185.3	100.0	1,589.8	100.0
----- Acres owned -----								
Farmer	979.9	18.2	2,152.8	15.6	635.9	6.9	11,499.9	13.0
White collar	1,148.8	21.4	2,449.3	17.8	889.4	9.7	13,112.1	14.8
Blue collar	591.2	11.0	1,915.6	13.9	673.5	7.3	8,547.1	9.6
Retired	471.9	8.8	2,909.6	21.1	1,164.8	12.7	15,444.0	17.4
Other	123.3	2.3	817.0	5.9	267.6	2.9	3,279.4	3.7
Total, individual	3,315.1	61.7	10,244.3	74.3	3,631.2	39.5	51,882.5	58.5
Corporate, estates, etc.	1,717.7	32.0	2,204.8	16.0	5,091.3	55.4	30,997.1	35.0
No answer	339.4	6.3	1,336.5	9.7	462.8	5.0	5,750.4	6.5
Total	5,372.2	100.0	13,785.6	100.0	9,185.3	100.0	88,630.0	100.0

¹Percents may not add to 100.0 because of rounding.

Table 13.—*Estimated number of private ownership units and acres of timberland owned by owner's age and by State, Midsouth region, 1978*¹

Owner's age	Alabama		Arkansas		Louisiana		Mississippi	
	Thousands	Percent	Thousands	Percent	Thousands	Percent	Thousands	Percent
<i>----- Owners -----</i>								
Under 35 years	52.7	12.3	25.2	8.2	32.0	14.9	2.2	1.2
35-49	90.0	21.0	34.7	11.3	52.0	24.2	35.8	19.4
50-64	126.5	29.5	41.6	13.5	35.6	16.5	28.8	15.6
65 plus	96.3	22.5	157.3	51.1	81.8	38.0	68.5	37.1
Corporate, estates, etc.	6.7	1.6	1.0	0.3	6.5	3.0	39.9	21.6
No answer	56.6	13.2	48.3	15.7	7.3	3.4	9.5	5.1
Total	428.8	100.0	308.1	100.0	215.2	100.0	184.7	100.0
<i>----- Acres owned -----</i>								
Under 35 years	346.2	1.8	653.4	4.5	134.5	1.1	399.2	2.8
35-49	2,602.5	13.2	1,763.8	12.0	1,142.2	9.6	1,586.6	11.3
50-64	4,604.2	23.3	2,942.9	20.1	1,388.5	11.7	2,916.8	20.8
65 plus	5,116.1	25.9	2,893.7	19.8	1,725.4	14.5	3,865.4	27.6
Corporate, estates, etc.	5,708.1	28.9	5,248.0	35.8	6,641.3	56.0	4,385.9	31.3
No answer	1,378.3	7.0	1,146.4	7.8	836.7	7.0	860.8	6.1
Total	19,755.4	100.0	14,648.2	100.0	11,868.6	100.0	14,014.7	100.0
<i>----- Owners -----</i>								
<i>----- Acres owned -----</i>								
Owner's age	Oklahoma		Tennessee		Texas		Midsouth	
	Thousands	Percent	Thousands	Percent	Thousands	Percent	Thousands	Percent
Under 35 years	5.4	12.5	17.5	7.8	0.4	0.2	135.4	8.5
35-49	8.1	18.8	70.7	31.5	35.3	19.1	326.6	20.5
50-64	23.2	53.7	40.7	18.1	70.9	38.3	367.3	23.1
65 plus	5.0	11.6	66.9	29.8	52.6	28.4	528.4	33.2
Corporate, estates, etc.	1.0	2.3	3.6	1.6	11.7	6.3	70.4	4.4
No answer	0.5	1.2	25.1	11.2	14.4	7.8	161.7	10.2
Total	43.2	100.0	224.5	100.0	185.3	100.0	1,589.8	100.0
Under 35 years	512.6	9.5	350.0	2.5	93.6	1.0	2,489.5	2.8
35-49	912.9	17.0	2,819.7	20.5	709.4	7.7	11,537.1	13.0
50-64	1,408.9	26.2	3,170.9	23.0	1,089.7	11.9	17,521.9	19.8
65 plus	672.4	12.5	3,763.1	27.3	1,656.8	18.0	19,692.9	22.2
Corporate, estates, etc.	1,717.7	32.0	2,204.8	16.0	5,091.3	55.4	30,997.1	35.0
No answer	147.7	2.7	1,477.1	10.7	544.5	5.9	6,391.5	7.2
Total	5,372.2	100.0	13,785.6	100.0	9,185.3	100.0	88,630.0	100.0

¹Percents may not add to 100.0 because of rounding.

Table 14.—*Estimated number of private ownership units and acres owned by owner's sex and by State, Midsouth region, 1978¹*

Sex	Alabama		Arkansas		Louisiana		Mississippi	
	Thousands	Percent	Thousands	Percent	Thousands	Percent	Thousands	Percent
----- Owners -----								
Male	264.2	61.6	227.4	73.8	158.7	73.7	67.5	36.5
Female	109.3	25.5	44.4	14.4	44.4	20.6	74.8	40.5
Corporate, estates, etc.	6.7	1.6	1.0	0.3	6.5	3.0	39.9	21.6
No answer	48.6	11.3	35.3	11.5	5.6	2.6	2.5	1.4
Total	428.8	100.0	308.1	100.0	215.2	100.0	184.7	100.0
----- Acres owned -----								
Male	10,459.5	52.9	6,626.5	45.2	3,424.6	28.9	7,273.4	51.9
Female	2,861.6	14.5	1,806.4	12.3	1,354.2	11.4	1,869.1	13.3
Corporate, estates, etc.	5,708.1	28.9	5,248.0	35.8	6,641.3	56.0	4,385.9	31.3
No answer	726.2	3.7	967.3	6.6	448.5	3.8	486.3	3.5
Total	19,755.4	100.0	14,648.2	100.0	11,868.6	100.0	14,014.7	100.0
	Oklahoma		Tennessee		Texas		Midsouth	
----- Owners -----								
Male	25.3	58.6	152.2	67.8	125.9	67.9	1,021.2	64.2
Female	16.3	37.7	54.3	24.2	34.4	18.6	377.9	23.8
Corporate, estates, etc.	1.0	2.3	3.6	1.6	11.7	6.3	70.4	4.4
No answer	0.6	1.4	14.4	6.4	13.3	7.2	120.3	7.6
Total	43.2	100.0	224.5	100.0	185.3	100.0	1,589.8	100.0
----- Acres owned -----								
Male	2,999.1	55.8	8,629.4	62.6	2,944.7	32.1	42,357.2	47.8
Female	479.5	8.9	2,150.2	15.6	698.4	7.6	11,219.4	12.7
Corporate, estates, etc.	1,717.7	32.0	2,204.8	16.0	5,091.3	55.4	30,997.1	35.0
No answer	175.9	3.3	801.2	5.8	450.9	4.9	4,056.3	4.6
Total	5,372.2	100.0	13,785.6	100.0	9,185.3	100.0	88,630.0	100.0

¹Percents may not add to 100.0 because of rounding.

Table 15.—Estimated number of private ownership units and acres owned by owner's race and by State, Midsouth region, 1978¹

Race	Alabama		Arkansas		Louisiana		Mississippi	
	Thousands	Percent	Thousands	Percent	Thousands	Percent	Thousands	Percent
----- Owners -----								
White	319.3	74.5	267.9	87.0	161.0	74.8	104.3	56.5
Black	50.8	11.8	21.1	6.8	33.8	15.7	32.4	17.5
Other	0.2	b	0.3	0.1	.....	.....	.....	.....
Corporate, estates, etc.	6.7	1.6	1.0	0.3	6.5	3.0	39.9	21.6
No answer	51.8	12.1	17.8	5.8	13.9	6.5	8.1	4.4
Total	428.8	100.0	308.1	100.0	215.2	100.0	184.7	100.0
----- Acres owned -----								
White	12,287.8	62.2	8,376.3	57.2	4,398.1	37.1	8,062.8	57.6
Black	783.7	4.0	135.0	0.9	347.5	2.9	1,000.4	7.1
Other	48.3	0.2	12.3	0.1	.....	.....	.....	.....
Corporate, estates, etc.	5,708.1	28.9	5,248.0	35.8	6,641.3	56.0	4,385.9	31.3
No answer	927.5	4.7	876.6	6.0	481.7	4.1	565.6	4.0
Total	19,755.4	100.0	14,648.2	100.0	11,868.6	100.0	14,014.7	100.0
	Oklahoma		Tennessee		Texas		Midsouth	
----- Owners -----								
White	33.0	76.4	187.5	83.5	143.7	77.5	1,216.7	76.5
Black	.....	.....	10.6	4.7	16.6	9.0	165.3	10.4
Other	8.7	20.1	.....	.....	.....	.....	9.2	0.6
Corporate, estates, etc.	1.0	2.3	3.6	1.6	11.7	6.3	70.4	4.4
No answer	0.5	1.2	22.8	10.2	13.3	7.2	128.2	8.1
Total	43.2	100.0	224.5	100.0	185.3	100.0	1,589.8	100.0
----- Acres owned -----								
White	3,092.2	57.6	10,263.0	74.4	3,434.2	37.4	49,914.4	56.3
Black	.....	.....	268.7	1.9	332.6	3.6	2,867.9	3.2
Other	390.0	7.3	.....	.....	.....	.....	450.6	0.5
Corproate, estates, etc.	1,717.7	32.0	2,204.8	16.0	5,091.3	55.4	30,997.1	35.0
No answer	172.3	3.2	1,049.1	7.6	327.2	3.6	4,400.0	5.0
Total	5,372.2	100.0	13,785.6	100.0	9,185.3	100.0	88,630.0	100.0

¹Percents may not add to 100.0 because of rounding.^a - Fewer than 100 owners.^b - Less than 0.05 percent.

Table 16.—*Estimated number of private ownership units and acres owned by owner's education and by State, Midsouth region, 1978¹*

Education	Alabama		Arkansas		Louisiana		Mississippi	
	Thousands	Percent	Thousands	Percent	Thousands	Percent	Thousands	Percent
----- Owners -----								
Jr. high or less	96.0	22.4	163.1	52.9	36.9	17.1	39.4	21.3
Some high school	44.4	10.4	24.3	7.9	47.1	21.9	9.1	4.9
High school	112.4	26.2	62.3	20.2	63.6	29.6	54.3	29.4
Some college	95.7	22.3	10.2	3.3	18.5	8.6	8.7	4.7
College plus	15.9	3.7	12.0	3.9	34.1	15.8	12.7	6.9
Corporate, estates, etc.	6.7	1.6	1.0	0.3	6.5	3.0	39.9	21.6
No answer	57.7	13.5	35.2	11.4	8.5	3.9	20.6	11.2
Total	428.8	100.0	308.1	100.0	215.2	100.0	184.7	100.0
----- Acres owned -----								
Jr. high or less	2,693.9	13.6	1,611.9	11.0	813.9	6.9	1,935.3	13.8
Some high school	1,599.7	8.1	994.9	6.8	481.4	4.1	865.3	6.2
High school	3,699.0	18.7	2,343.3	16.0	1,247.7	10.5	2,166.3	15.5
Some college	1,668.6	8.4	1,362.1	9.3	670.9	5.7	1,188.9	8.5
College plus	2,882.3	14.6	1,396.7	9.5	1,105.9	9.3	2,304.4	16.4
Corporate, estates, etc.	5,708.1	28.9	5,248.0	35.8	6,641.3	56.0	4,385.9	31.3
No answer	1,503.8	7.6	1,691.3	11.5	907.5	7.6	1,168.6	8.3
Total	19,755.4	100.0	14,648.2	100.0	11,868.6	100.0	14,014.7	100.0
Oklahoma		Tennessee		Texas		Midsouth		
----- Owners -----								
Jr. high or less	14.9	34.5	94.4	42.0	6.7	3.6	451.4	28.4
Some high school	8.4	19.4	16.8	7.5	9.7	5.2	159.8	10.1
High school	7.8	18.1	34.3	15.3	23.8	12.8	358.5	22.6
Some college	5.0	11.6	32.6	14.5	10.5	5.7	181.2	11.4
College plus	4.7	10.9	16.2	7.2	106.0	57.2	201.6	12.7
Corporate, estates, etc.	1.0	2.3	3.6	1.6	11.7	6.3	70.4	4.4
No answer	1.4	3.2	26.6	11.8	16.9	9.1	166.9	10.5
Total	43.2	100.0	224.5	100.0	185.3	100.0	1,589.8	100.0
----- Acres owned -----								
Jr. high or less	512.9	9.5	3,153.5	22.9	545.5	5.9	11,266.9	12.7
Some high school	466.2	8.7	1,244.8	9.0	649.9	7.1	6,302.2	7.1
High school	778.9	14.5	2,002.5	14.5	935.9	10.2	13,173.6	14.9
Some college	747.3	13.9	1,324.9	9.6	499.4	5.4	7,462.1	8.4
College plus	791.4	14.7	1,855.6	13.5	810.9	8.8	11,147.2	12.6
Corporate, estates, etc.	1,717.7	32.0	2,204.8	16.0	5,091.3	55.4	30,997.1	35.0
No answer	357.8	6.7	1,999.5	14.5	652.4	7.1	8,280.9	9.3
Total	5,372.2	100.0	13,785.6	100.0	9,185.3	100.0	88,630.0	100.0

¹Percents may not add to 100.0 because of rounding.

Table 17.—*Estimated number of private ownership units and acres owned by owner's residence in Midsouth States and region, 1978¹*

Residence	Alabama		Arkansas		Louisiana		Mississippi	
	Thousands	Percent	Thousands	Percent	Thousands	Percent	Thousands	Percent
----- Owners -----								
Same county	359.5	83.8	220.5	71.6	187.6	87.2	130.4	70.6
Other county, same state	17.0	4.0	21.9	7.1	19.8	9.2	5.5	3.0
Different state or country	3.9	0.9	35.8	11.6	7.2	3.3	11.7	6.3
No answer	48.4	11.3	29.9	9.7	0.6	0.3	37.1	20.1
Total	428.8	100.0	308.1	100.0	215.2	100.0	184.7	100.0
----- Acres owned -----								
Same county	12,065.7	61.1	7,109.0	48.5	4,468.8	37.7	7,947.7	56.7
Other county, same state	4,533.2	22.9	2,467.8	16.8	2,802.8	23.6	1,831.7	13.1
Different state or country	1,328.8	6.7	3,198.8	21.8	4,271.0	36.0	1,461.3	10.4
No answer	1,827.7	9.3	1,872.6	12.8	326.0	2.7	2,774.0	19.8
Total	19,755.4	100.0	14,648.2	100.0	11,868.6	100.0	14,014.7	100.0
	Oklahoma		Tennessee		Texas		Midsouth	
----- Owners -----								
Same county	32.7	75.7	186.2	82.9	150.1	81.0	1,267.0	79.7
Other county, same state	6.4	14.8	29.2	13.0	17.0	9.2	116.8	7.3
Different state or country	2.8	6.5	6.9	3.1	5.0	2.7	73.3	4.6
No answer	1.3	3.0	2.2	1.0	13.2	7.1	132.7	8.3
Total	43.2	100.0	224.5	100.0	185.3	100.0	1,589.8	100.0
----- Acres owned -----								
Same county	3,034.0	56.5	9,864.8	71.6	3,803.2	41.4	48,293.2	54.5
Other county, same state	624.8	11.6	2,061.8	15.0	3,176.8	34.6	17,498.9	19.7
Different state or country	1,437.9	26.8	1,281.3	9.3	968.6	10.5	13,947.7	15.7
No answer	275.5	5.1	577.7	4.2	1,236.7	13.5	8,890.2	10.0
Total	5,372.2	100.0	13,785.6	100.0	9,185.3	100.0	88,630.0	100.0

¹Percents may not add to 100.0 because of rounding.

Table 18.—*Estimated number of private ownership units and acres owned by size of holding in Midsouth States and region, 1978¹*

Size of holding	Alabama		Arkansas		Louisiana		Mississippi	
	Thousands	Percent	Thousands	Percent	Thousands	Percent	Thousands	Percent
----- Owners -----								
Less than 10 ac.	326.4	76.1	218.9	71.0	155.2	72.1	89.5	48.5
10–49 ac.	36.1	8.4	49.9	16.2	36.9	17.1	44.4	24.0
50–99 ac.	29.3	6.8	15.6	5.1	11.3	5.3	20.4	11.0
100–499 ac.	31.9	7.4	21.0	6.8	8.8	4.1	27.7	15.0
500–999 ac.	3.0	0.7	1.6	0.5	1.8	0.8	1.6	0.9
1,000–4,999 ac.	1.8	0.4	1.0	0.3	1.0	0.5	1.0	0.5
5,000–9,999 ac.	0.1	^b	^a	^b	0.1	^b	^a	^b
10,000 + ac.	0.2	^b	0.1	^b	0.1	^b	0.1	^b
Total	428.8	100.0	308.1	100.0	215.2	100.0	184.7	100.0
----- Acres owned -----								
Less than 10 ac.	634.1	3.2	305.1	2.1	249.1	2.1	260.3	1.9
10–49 ac.	1,049.9	5.3	1,308.0	8.9	932.6	7.9	1,080.0	7.7
50–99 ac.	2,069.1	10.5	1,128.1	7.7	798.2	6.7	1,425.2	10.2
100–499 ac.	5,980.8	30.3	4,272.3	29.2	2,103.8	17.7	5,340.0	38.1
500–999 ac.	2,018.7	10.2	1,020.0	7.0	1,247.6	10.5	1,129.7	8.1
1,000–4,999 ac.	3,413.8	17.3	1,700.3	11.6	1,671.2	14.1	1,565.6	11.2
5,000–9,999 ac.	587.5	3.0	252.3	1.7	672.7	5.7	215.4	1.5
10,000 + ac.	4,001.5	20.3	4,662.1	31.8	4,193.4	35.3	2,998.5	21.4
Total	19,755.4	100.0	14,648.2	100.0	11,868.6	100.0	14,014.7	100.0
	Oklahoma		Tennessee		Texas		Midsouth	
----- Owners -----								
Less than 10 ac.	9.2	21.3	95.7	42.6	138.6	74.8	1,033.5	65.0
10–49 ac.	19.4	44.9	71.0	31.6	23.4	12.6	281.1	17.7
50–99 ac.	6.0	13.9	25.9	11.5	11.6	6.3	120.1	7.6
100–499 ac.	7.2	16.7	29.2	13.0	10.7	5.8	136.5	8.6
500–999 ac.	1.1	2.5	1.5	0.7	0.7	0.4	11.3	0.7
1,000–4,999 ac.	0.3	0.7	1.0	0.4	0.2	0.1	6.3	0.4
5,000–9,999 ac.	^a	^b	0.1	^b	^a	^b	0.3	^b
10,000 + ac.	^a	^b	0.1	^b	0.1	^b	0.7	^b
Total	43.2	100.0	224.5	100.0	185.3	100.0	1,589.8	100.0
----- Acres owned -----								
Less than 10 ac.	49.2	0.9	245.6	1.8	309.8	3.4	2,053.2	2.3
10–49 ac.	400.6	7.5	1,761.5	12.8	660.1	7.2	7,192.7	8.1
50–99 ac.	462.5	8.6	1,762.3	12.8	773.2	8.4	8,418.6	9.5
100–499 ac.	1,253.3	23.3	5,298.0	38.4	1,954.8	21.3	26,203.0	29.6
500–999 ac.	736.8	13.7	1,011.9	7.3	516.7	5.6	7,681.4	8.7
1,000–4,999 ac.	484.8	9.0	1,800.1	13.1	464.5	5.1	11,100.3	12.5
5,000–9,999 ac.	236.9	4.4	399.4	2.9	296.7	3.2	2,660.9	3.0
10,000 + ac.	1,748.1	32.5	1,506.8	10.9	4,209.5	45.8	23,319.9	26.3
Total	5,372.2	100.0	13,785.6	100.0	9,185.3	100.0	88,630.0	100.0

¹Percents may not add to 100.0 because of rounding.^a - Fewer than 100 owners.^b - Less than 0.05 percent.

Table 19.—Sampling errors for type of ownership, owner's occupation, age, sex, race, education, residence, and size of holding by State, Midsouth region, 1978

Table	Alabama			Arkansas			Louisiana			Mississippi			Oklahoma			Tennessee			Texas			Midsouth		
	Owners	Acres		Owners	Acres		Owners	Acres		Owners	Acres		Owners	Acres		Owners	Acres		Owners	Acres		Owners	Acres	
----- Percent -----																								
Table 11.																								
Sole proprietor	24.7	4.7	28.4	7.4	34.4	6.7	31.5	5.2	38.2	9.4	25.6	6.2	33.1	5.2	17.5	3.3								
Family (husband & wife)	37.3	4.5	41.8	8.6	49.7	5.3	20.5	5.3	33.0	10.2	31.9	5.8	77.6	9.8	25.7	5.4								
Family partnership	20.7	9.5	22.8	13.2	29.4	19.4	51.8	7.2	43.8	7.9	23.0	11.9	90.8	7.8	34.5	7.2								
Nonfamily partnership	14.8	3.0	39.2	16.9	33.9	21.8	52.6	30.1	1.5	0	82.2	20.6	19.6	9.0	47.6	13.4								
Family corporation	35.6	11.7	60.4	16.8	44.0	26.7	38.2	22.8	37.3	14.2	46.9	25.6	100.0	100.0	33.3	14.4								
Other	37.0	4.5	44.9	3.7	37.1	8.0	94.6	4.1	57.8	8.6	51.4	7.8	63.9	5.4	69.0	3.1								
Total	20.4	2.5	27.9	3.3	27.7	4.2	26.3	3.0	24.6	5.2	20.8	3.5	32.0	2.9	14.2	1.8								
Table 12.																								
Farmer	54.9	2.8	18.5	10.1	88.9	19.2	15.9	9.0	33.5	10.6	17.7	8.2	86.4	10.1	42.6	4.8								
White collar	55.0	7.1	36.2	11.5	40.1	10.2	29.2	4.8	35.3	11.5	54.6	7.3	85.4	6.4	32.5	4.8								
Blue collar	41.8	11.7	38.6	7.2	56.0	6.5	42.2	10.6	36.3	22.3	21.4	8.1	46.5	11.0	26.1	6.0								
Retired	34.4	5.7	45.7	12.0	42.8	14.5	44.8	6.4	45.3	10.6	22.9	8.3	42.1	9.4	22.4	5.0								
Other	67.9	7.2	49.3	13.1	36.3	7.8	44.1	11.7	100.0	100.0	48.9	16.8	35.2	14.9	43.2	9.4								
Total, individual	20.6	3.2	27.8	5.0	28.0	6.7	23.8	3.7	24.7	6.7	21.0	4.1	33.5	4.2	27.4	4.8								
Corporate, estates, etc.	29.2	3.2	34.7	2.4	26.7	5.5	86.2	5.1	46.8	7.1	46.7	5.0	46.6	4.0	57.2	2.4								
No answer	65.2	11.5	57.0	12.8	62.1	17.2	21.0	16.5	56.9	17.0	40.8	17.8	85.2	10.8	43.2	8.6								
Table 13.																								
Under 35 years	61.4	2.3	62.0	23.5	81.0	5.5	37.6	33.7	47.0	15.3	44.5	11.7	46.4	5.1	62.9	17.2								
35-49	53.1	8.1	32.2	8.7	50.3	15.0	48.2	11.1	40.5	13.9	56.3	7.7	69.0	12.7	52.0	9.9								
50-64	35.1	5.2	42.8	9.0	33.0	6.3	20.7	5.4	40.5	11.3	23.6	6.6	66.7	7.2	39.8	17.6								
65 plus	34.4	5.0	49.3	10.0	53.5	13.7	42.4	5.2	36.4	15.1	26.4	7.0	40.5	6.4	42.4	7.4								
No answer	59.3	13.2	48.8	12.1	50.2	18.5	35.8	12.9	59.4	11.5	40.4	16.8	85.8	10.4	53.7	14.2								
Table 14.																								
Male	23.9	3.7	35.4	5.9	32.8	6.7	13.9	4.2	19.8	7.3	27.3	4.1	42.5	5.2	29.9	4.8								
Female	45.4	8.2	43.3	12.0	59.7	17.6	43.7	7.5	53.3	21.4	33.6	9.9	58.4	8.3	46.3	10.7								
No answer	68.6	7.9	59.6	14.2	63.0	23.5	29.3	22.2	71.0	27.3	66.0	27.7	92.9	11.3	67.2	18.0								
Table 15.																								
White	23.7	3.4	30.1	5.3	32.2	7.3	28.4	4.0	23.6	7.1	24.1	3.9	39.5	4.4	28.7	4.6								
Black	51.1	19.1	78.4	9.1	77.0	21.6	52.3	9.0	37.8	23.0	37.8	23.0	38.0	21.0	58.0	16.0								
Other	49.4	....	100.0	100.0	....	....	....	....	81.1	26.7	....	....	....	....	98.3	30.4								
No answer	64.6	6.4	73.5	15.6	59.9	22.2	59.2	19.4	71.1	29.8	43.6	22.8	93.4	13.6	64.0	16.9								

Table 16.

Jr. high or less	37.1	8.2	48.1	10.7	71.4	28.2	43.5	7.6	60.1	26.3	43.0	7.8	33.8	17.3	46.4	11.1
Some high school	55.4	11.1	42.7	19.9	75.2	6.4	17.0	8.2	40.8	22.9	44.6	11.7	44.7	12.2	54.5	12.8
High school	37.7	6.0	35.6	9.4	42.2	10.8	52.9	7.4	34.3	12.7	27.4	6.4	47.4	8.4	40.0	7.9
Some college	54.4	9.6	20.9	10.9	44.0	8.7	29.4	16.1	33.0	14.5	46.7	10.9	57.9	8.2	48.5	11.4
College plus	28.8	6.4	62.8	13.2	78.3	4.7	15.1	5.7	35.3	11.1	27.1	10.7	50.8	7.4	49.9	8.1
No answer	58.4	8.5	50.9	12.7	43.2	21.1	35.2	11.9	32.3	16.1	37.6	12.5	73.8	8.9	53.6	12.5

Table 17.

Same county	22.3	2.8	36.8	5.5	30.9	7.6	26.1	4.0	30.9	7.2	24.3	4.4	37.9	5.7	28.8	4.7
Other county, same state	25.2	6.5	43.2	8.4	43.7	8.9	19.6	10.8	43.2	18.4	36.5	8.0	41.3	3.5	37.6	7.6
Different state or county	51.7	14.0	50.4	5.1	35.5	4.0	48.0	8.3	38.2	8.1	32.2	11.4	66.9	8.9	47.5	7.1
No answer	70.0	4.0	60.6	6.0	99.7	67.1	92.3	4.3	29.2	21.5	62.9	6.4	93.9	5.6	76.1	7.8

Table 18.

Less than 10 ac.	15.7	8.7	27.5	18.2	23.5	9.2	33.1	42.8	33.3	0	37.5	17.6	28.9	11.3	24.8	15.7
10-49 ac.	8.6	5.2	22.7	19.6	11.3	12.4	16.1	8.9	34.4	24.6	12.9	9.4	20.5	21.1	16.5	12.9
50-99 ac.	12.4	11.1	12.6	11.6	7.6	6.4	8.0	7.5	21.1	22.9	10.4	9.8	13.2	10.3	11.3	10.4
100-499 ac.	6.5	5.3	8.0	7.2	11.0	15.6	6.0	5.3	12.3	10.7	8.1	5.7	10.4	6.5	7.9	6.9
500-999 ac.	8.0	8.2	12.9	10.3	14.8	15.4	9.3	11.0	18.3	15.7	9.4	9.2	10.2	10.8	11.1	11.1
1,000-4,999 ac.	6.6	6.0	9.0	9.1	19.1	15.1	8.8	8.0	21.6	14.0	19.0	14.0	20.0	13.2	12.1	10.1
5,000-9,999 ac.	5.9	2.5	29.8	34.7	15.5	12.9	13.1	7.2	26.3	23.0	16.0	13.7	12.5	12.2	20.3	13.1
10,000 + ac.	5.4	1.6	8.9	2.4	8.6	3.2	6.6	6.0	22.4	6.5	12.1	6.6	8.0	3.2	8.0	3.6

Rosson, J. F., Jr. and Doolittle, L. Profiles of Midsouth nonindustrial private forests and owners. Resour. Bull. SO-125. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 1987. 39 p.

This report presents state-level findings of NIPF resources for the Midsouth. Also presented are profiles of various categories of NIPF owners.

Additional keywords: ownership, NIPF, timberland, Midsouth, forest survey.







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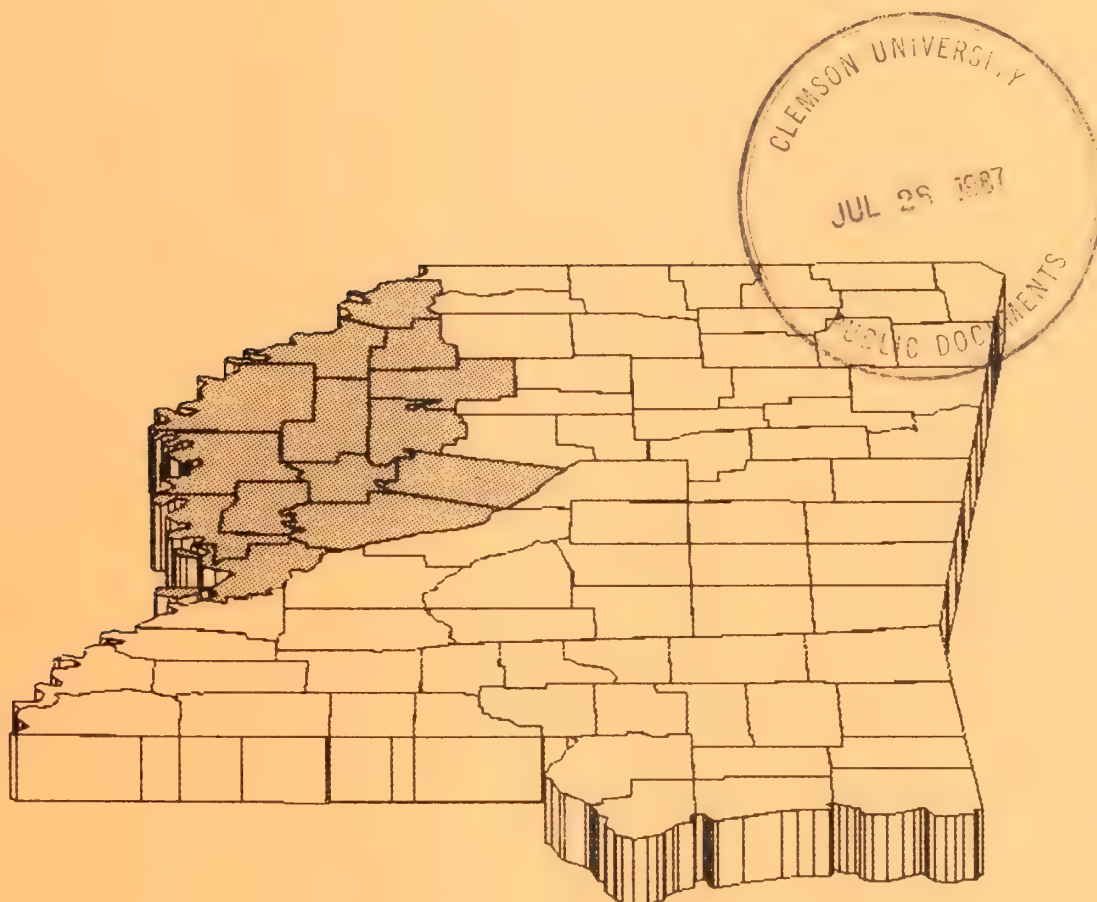
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Forest Statistics for Mississippi Delta Counties - 1987

John F. Kelly and F. Dee Hines



SUMMARY

The 1987 survey of the 14 counties in the Mississippi Delta unit indicated the following changes since the previous survey in 1977:

- * Timberland area, now covering 1,388.3 thousand acres, has decreased 6 percent.
- * Forest industry-owned timberland decreased 127.9 thousand acres, or 49 percent; other public land increased 70.3 thousand acres.
- * The oak-gum-cypress forest type decreased by 87.1 thousand acres, or 10 percent; it now accounts for 55 percent of total timberland.
- * Sawtimber stands increased 70.4 thousand acres, and now account for 70 percent of all timberland.
- * Hardwood growing-stock volume increased 23 percent, and now accounts for 93 percent of all volume; hardwood sawtimber similarly increased by 26 percent.
- * Softwood growing-stock volume increased 24 percent; sawtimber volume increased 50 percent.
- * Net growth of hardwood growing stock increased 21 percent; net growth of softwood growing stock did not change.
- * Removals of growing stock decreased 31 percent, with the decrease attributable to hardwoods.

FOREWORD

The Southern Forest Survey, an activity of the Southern Forest Experiment Station Forest Inventory and Analysis work unit, covers the States of Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, Tennessee, and East Texas, and the island of Puerto Rico.

This survey is part of the nationwide Forest Survey originally authorized by the McSweeney-McNary Act of 1928. More recent legislation pertinent to the survey mission includes the Forest and Rangeland Renewable Resources Planning Act of 1974 and the Forest and Rangeland Renewable Resources Research Act of 1978. The survey mission is to develop, analyze, and maintain renewable forest resource information. This information is essential for formulation of forest policies and programs.

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*Core tables are presented in response to the Southern Industrial Forestry Research Council's recommendations. These tables are identical among Forest Inventory and Analysis units in the eastern United States.

Forest Statistics for Mississippi Delta Counties—1987

John F. Kelly and F. Dee Hines

INTRODUCTION

The tables in this report were derived from data obtained from an inventory of 14 counties comprising the Delta Unit of Mississippi (Fig. 1). The data on forest acreage and timber volume were secured by a three-step process. A forest-nonforest classification was accomplished on aerial photographs for points representing approximately 230 acres. These photo classifications were adjusted on the basis of ground observations at sample locations representing approximately 3,840 acres. Finally, forest locations at the intersections of a grid of lines spaced 3 miles apart were subjected to on-the-ground measurements. At these forest locations, per-acre estimates were obtained from trees measured on ten 37.5 basal area factor prism points.

The sampling methods were designed to achieve suitable sampling errors for estimates

of area and volume at the State level. Sampling error increases as the area or volume considered decreases. The sampling errors presented in Table I, equal to one standard deviation for the sample data, may be used to construct confidence intervals for population parameters. For example, at the 95 percent confidence level, the confidence interval for growing-stock volume (in million cubic feet) in the Delta Unit (with a sampling error of 5.3 percent) is

$$1,916.3 \pm 1.96(0.053 \times 1,916.3) = 1,916.3 \pm 199.1$$

where 1.96 is the number of standard deviations. This confidence interval indicates that the actual growing-stock volume lies in the range 1,717.2 to 2,115.4 million cubic feet, unless a 1 in 20 chance of a random event has occurred.

Table I—Sampling errors¹ for timberland, growing stock, and sawtimber, Mississippi Delta, 1987

County	Timberland	Growing stock			Sawtimber volume
		Volume	Growth	Removals	
----- <i>Percent</i> -----					
Bolivar	0.8	12.0	(2)	40.4	17.4
Coahoma	1.2	11.9	(2)	44.3	18.0
Holmes	1.8	11.6	8.9	31.4	16.7
Humphreys ³	1.0	15.7	24.4	23.6	19.8
Issaquena	2.4	14.5	19.8	23.3	17.2
Quitman ⁴	1.3	19.6	38.0	22.3	24.9
Sharkey	1.3	18.3	20.9	16.9	21.4
Sunflower ⁵	0.7	16.4	15.7	48.4	24.1
Tallahatchie	1.3	18.0	16.2	31.7	23.5
Warren	2.0	13.2	12.0	15.3	17.1
Yazoo	1.7	8.8	7.2	22.4	11.9
All counties	0.4	5.3	5.6	10.1	7.1

¹ By random-sampling formula.

² Sampling error greater than 50.

³ Leflore included in Humphreys.

⁴ Tunica included in Quitman.

⁵ Washington included in Sunflower.

Sampling errors for sub-groups of counties in the unit may be estimated by the following:

$$SE_g = \frac{SE_t \sqrt{X_t}}{\sqrt{X_g}}$$

where:

SE = standard error of estimate
(expressed as a percent)

X = variable of interest
(area or volume)

g = group of counties to be combined

t = total for the unit.

For comparative purposes, the 1977 survey data, collected from the last complete forest survey of Mississippi, was reprocessed according to current procedures. These procedures included the use of the same methods for estimating growth and removals. Thus, differences between the 1977 and 1987 data should reflect resource changes and not data processing differences. The results from the reprocessed 1977 survey data were used for comparison to the 1987 data in the Highlights that follow.

HIGHLIGHTS

Timberland Area

There are 1,388.3 thousand acres of timberland in Mississippi's Delta Unit, a decrease of 88.3 thousand acres, or 6 percent, since 1977. The region is now 25 percent forested.

Timberland owned by forest industry has decreased, while other public timberland has increased. Forest industry timberland decreased 127.9 thousand acres, or 49 percent. Timberland in the other public ownership category—which excludes National Forests—increased 70.3 thousand acres to 114.8 thousand acres. Timberland in the other private ownership category decreased slightly (2 percent); this category accounts for 78 percent of all timberland in the Delta Unit.

Forest type changes since 1977 have been relatively small. Despite a 10 percent de-

cline, the oak-gum-cypress type still covers 55 percent of the timberland. The oak-pine type declined 16.0 thousand acres; and the elm-ash-cottonwood type declined 19.7 thousand acres. The only types showing gains were oak-hickory, up 20.2 thousand acres, and loblolly-shortleaf pine, up 21.0 thousand acres.

Mississippi Delta forests are increasingly dominated by sawtimber-size stands. Sawtimber stands increased 70.4 thousand acres to 968.4 thousand acres, currently accounting for 70 percent of total timberland area. Sapling-seedling stands decreased from 193.1 thousand acres to 79.3 thousand acres. Pole-timber stands decreased 48.7 thousand acres.

Plantations are relatively sparse in the region, covering only 37.5 thousand acres.

Number of Trees

The number of all live trees in the Delta Unit has declined since 1977, principally due to change in hardwoods. The 24 percent decrease in number of hardwood trees was attributable mainly to the decrease of trees in the 8-inch and smaller diameter-at-breast height (dbh) classes. Although the number of hardwood trees in the 12-inch dbh class decreased, all other classes larger than 8 inches showed an increase. A similar pattern is evident for softwood live trees, although they account for only 4 percent of the total.

The number of growing-stock trees decreased even more than all live trees. The number of hardwood growing-stock trees decreased 55 percent; this change is attributable mainly to trees in the 6-inch and smaller dbh classes, although a small decrease is also evident in the 12-inch class.

Timber Volume

Growing-stock volume is dominated by hardwoods, which account for 93 percent of the total growing-stock volume. Hardwood growing-stock volume increased by 335.5 million cubic feet since 1977 to 1,783.6 million cubic feet. This 23 percent increase since

1977 is similar to the 20 percent increase indicated for the previous survey period, 1967-1977. Hardwood sawtimber increased 26 percent since 1977, from 5,531.4 million board feet to 6,975.0 million board feet in 1987; this change is also similar to the 27 percent increase in the 1967-1977 period.

Softwood growing-stock volume increased 24 percent since 1977, from 107.2 million cubic feet to 132.8 million cubic feet. A 37 percent increase occurred during the previous survey period. Softwood sawtimber increased from 351.0 million board feet in 1977 to 526.4 million board feet in 1987; this increase is somewhat larger than the change from 1967 to 1977.

The volume of cull trees has increased since 1977, all due to hardwoods which account for 97 percent of cull volume in the Delta Unit. Hardwood cull volume increased from 333.3 million cubic feet to 460.0 million cubic feet, a 38 percent increase.

Growth, Removals, and Mortality

Total net annual growth—which is also dominated by hardwoods—increased 18 percent since the 1977 survey. Growth is calculated as an annual average for the inter-survey period, i.e., 1977-1987; removals and mortality are similarly calculated. Hardwood growth increased from 56.5 million cubic feet annually in the 1967-1977 survey period to 68.1 million cubic feet annually in the current survey period. Softwood growth is currently at 6.5 million cubic feet annually, similar to the 6.6 million cubic feet estimated for the 1977 survey.

Growing-stock removals have decreased since the 1977 survey, with the decrease attributable to hardwoods. Hardwood removals decreased from 44.0 million cubic feet annually in the 1977 survey to 27.6 million cubic feet for the current survey, a decrease of 37 percent. Softwood removals increased from 3.6 million cubic feet annually to 5.2 million cubic feet. Total volume removed from growing stock for the 1977-1987 period is less than one-half the volume of growth.

Mortality has changed only slightly since the previous survey period. Hardwood mortality has decreased a small amount, while softwood mortality increased slightly. Hardwood mortality is 14.9 million cubic feet annually for the current survey, down from 17.0 million cubic feet in the previous survey period. Softwood mortality is 1.0 million cubic feet annually, up slightly from 0.6 million cubic feet in the 1977 survey.

Tables 1-25 were developed to provide compatibility among Forest Inventory and Analysis Projects. Tables 26-36 are supplementary tables and may change from unit to unit or state to state to address specific resource issues.

DEFINITION OF TERMS

Average net annual growth.—Average net annual volume increase for the inter-survey period.

Average annual mortality.—Average annual sound-wood volume of growing-stock trees dying from natural causes.

Average annual removals.—Average net annual volume of growing-stock trees removed from the inventory by harvesting, cultural operations (such as timber-stand improvement), land clearing, or changes in land use.

Forest type.—A classification of forest land based upon the species forming a plurality of live-tree stocking.

Growing-stock trees.—Live trees of commercial species. Rough and rotten trees are excluded.

Growing-stock volume.—The cubic-foot volume of sound wood in growing-stock trees at least 5.0 inches in diameter at breast height, from a 1-foot stump to a minimum 4.0-inch top diameter outside bark of the central stem, or to the point where the central stem breaks into limbs.

Noncommercial species.—Tree species of typically small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products.

Poletimber trees.—Growing-stock trees of commercial species at least 5.0 inches in diameter at breast height, but smaller than sawtimber size.

Rotten trees.—Live trees of commercial species that do not contain at least one 12-foot saw log, now or prospectively, primarily because of rot.

Reserved timberland.—Productive public forest land withdrawn from timber utilization through statute or administrative regulations.

Rough trees.—Live trees of commercial species that do not contain at least one 12-foot saw log, now or prospectively, primarily because of roughness or poor form. Also included are all live trees of noncommercial species.

Sawtimber trees.—Live trees that are of commercial species, contain at least a 12-foot saw log, and meet regional specifications for freedom from defect. Softwoods must be at least 9.0 inches in diameter at breast height and hardwoods at least 11.0 inches in diameter at breast height.

Sawtimber volume.—Sound-wood volume of the saw-log portion of live sawtimber trees in board feet, International 1/4-inch rule and in cubic feet.

Site class.—A classification of forest land in terms of inherent capacity to grow crops of industrial wood.

Stand-size class.—A classification of forest land based on the size class of growing-stock trees on the sampled area; that is, sawtimber, poletimber, or sapling and seedling.

Timberland.—Forest land that is producing, or is capable of producing, crops of industrial wood and not withdrawn from timber utilization. Timberland is synonymous with “commercial forest land” in prior reports.

Tree grade.—A classification of the volume of the saw-log portion of sawtimber trees, based on the log grade of the butt log.

Woodland.—Forest land incapable of yielding crops of industrial wood because of adverse site conditions.

Table 1—Area by county and land class, Mississippi Delta, 1987

County	All land ¹	Forest land			Reserved timberland	Nonforest land
		Total	Timberland ²	Woodland ³		
----- <i>Thousand acres</i> -----						
Bolivar	571.2	66.3	66.3	...	...	504.9
Coahoma	357.8	56.6	56.6	...	...	301.2
Holmes	486.0	255.9	255.9	...	...	230.0
Humphreys ⁴	662.3	99.2	99.2	...	...	563.1
Issaquena	260.1	98.4	98.4	...	...	161.7
Leflore ⁴	...	...	...	...	...	...
Quitman ⁵	554.3	89.6	89.6	...	...	464.7
Sharkey	278.3	72.7	72.7	...	...	205.6
Sunflower ⁶	921.2	98.6	98.6	...	...	822.6
Tallahatchie	416.3	97.2	97.2	...	...	319.2
Tunica ⁵	...	...	...	...	...	...
Warren	381.7	214.2	212.3	...	1.9	167.6
Washington ⁶	...	...	...	...	...	...
Yazoo	597.2	241.6	241.6	...	...	355.6
All counties	5486.4	1390.2	1388.3	...	1.9	4096.3

¹ From U.S. Bureau of the Census.

² Forest land (formerly termed commercial forest land) that is producing or capable of producing at least 20 cubic feet of industrial wood per acre per year. Includes areas which may be inaccessible or inoperable by current standards. Excludes reserved timberlands.

³ Forest land incapable of producing 20 cubic feet of industrial wood per acre per year under natural conditions because of adverse site conditions.

⁴ Leflore included in Humphreys.

⁵ Tunica included in Quitman.

⁶ Washington included in Sunflower.

Table 2—Area of timberland by county and ownership class, Mississippi Delta, 1987

County	All ownerships	National forest	Misc. federal	State	County and municipal	Forest industry ¹	Farmer	Corporate ²	Individual ²
----- Thousand acres -----									
Bolivar	66.3	...	...	16.6	...	8.3	16.6	4.1	20.7
Coahoma	56.6	...	...	...	...	...	20.2	8.1	28.3
Holmes	255.9	...	19.2	...	...	25.6	108.8	25.6	76.8
Humphreys ³	99.2	...	8.3	...	8.3	...	24.8	16.5	41.3
Issaquena	98.4	...	...	...	5.5	54.6	5.5	16.4	16.4
Quitman ⁴	89.6	...	...	...	...	...	52.3	...	37.3
Sharkey	72.7	57.1	...	...	...	...	...	10.4	5.2
Sunflower ⁵	98.6	...	9.0	...	...	9.0	35.9	17.9	26.9
Tallahatchie	97.2	...	...	...	...	...	54.7	...	42.5
Warren	212.3	...	5.7	5.7	...	34.4	40.2	22.9	103.3
Yazoo	241.6	...	29.3	7.3	...	...	117.1	14.6	73.2
All counties	1388.3	57.1	71.4	29.6	13.7	131.9	475.9	136.6	471.9

¹ Includes land leased to forest industry.

² Indian land will be classed as corporate or individual as defined by the Bureau of Indian Affairs.

³ Leflore included in Humphreys.

⁴ Tunica included in Quitman.

⁵ Washington included in Sunflower.

Table 3—Area of timberland by county and forest type group, Mississippi Delta, 1987

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-Gum Cypress	Elm-ash- Cottonwood
		Planted	Natural				
----- Thousand acres -----							
Bolivar	66.3	...	...	...	4.1	45.6	16.6
Coahoma	56.6	...	...	...	...	52.6	4.0
Holmes	255.9	19.2	19.2	38.4	115.2	64.0	...
Humphreys ¹	99.2	...	...	...	...	99.2	...
Issaquena	98.4	...	...	...	5.5	92.9	...
Quitman ²	89.6	...	...	...	...	74.7	14.9
Sharkey	72.7	...	...	...	...	72.7	...
Sunflower ³	98.6	...	...	...	...	80.7	17.9
Tallahatchie	97.2	...	...	12.1	48.6	36.4	...
Warren	212.3	...	...	...	131.9	63.1	17.2
Yazoo	241.6	...	...	7.3	146.4	80.5	7.3
All counties	1388.3	19.2	19.2	57.9	451.7	762.3	78.0

¹ Leflore included in Humphreys.

² Tunica included in Quitman.

³ Washington included in Sunflower.

**Table 4—Area of timberland by county and stand-size class,
Mississippi Delta, 1987**

County	All classes	Stand-size class			Nonstocked ¹ areas
		Sawtimber	Poletimber	Sapling- seedling	
-----Thousand acres-----					
Bolivar	66.3	58.0	8.3	...	...
Coahoma	56.6	48.5	8.1	...	...
Holmes	255.9	134.4	70.4	51.2	...
Humphreys ²	99.2	57.9	33.1	8.3	...
Issaquena	98.4	71.0	16.4	...	10.9
Quitman ³	89.6	67.2	22.4	...	...
Sharkey	72.7	46.7	20.8	5.2	...
Sunflower ⁴	98.6	71.7	17.9	...	9.0
Tallahatchie	97.2	66.8	30.4	...	...
Warren	212.3	177.8	34.4	...	...
Yazoo	241.6	168.4	58.6	14.6	...
All counties	1388.3	968.4	320.7	79.3	19.9

¹ Timberland less than 16.7 percent stocked.

² Leflore included in Humphreys.

³ Tunica included in Quitman.

⁴ Washington included in Sunflower.

**Table 5—Area of timberland by county and site class,
Mississippi Delta, 1987**

County	All classes	Site class (cubic feet/acre/year)				
		>165	120-165	85-120	50-85	<50
-----Thousand acres-----						
Bolivar	66.3	33.1	12.4	16.6	4.1	...
Coahoma	56.6	12.1	28.3	12.1	4.0	...
Holmes	255.9	51.2	64.0	121.6	19.2	...
Humphreys ¹	99.2	8.3	33.1	49.6	8.3	...
Issaquena	98.4	38.3	5.5	43.7	5.5	5.5
Quitman ²	89.6	...	37.3	44.8	7.5	...
Sharkey	72.7	5.2	26.0	36.4	5.2	...
Sunflower ³	98.6	9.0	17.9	53.8	17.9	...
Tallahatchie	97.2	6.1	18.2	72.9	...	...
Warren	212.3	80.3	45.9	45.9	40.2	...
Yazoo	241.6	36.6	124.4	73.2	7.3	...
All counties	1388.3	280.1	413.0	570.5	119.2	5.5

¹ Leflore included in Humphreys.

² Tunica included in Quitman.

³ Washington included in Sunflower.

Table 6—Area of timberland by county and stocking classes of growing-stock trees, Mississippi Delta, 1987

County	All classes	Stocking class (percent)				
		>130	100-130	60-100	16.7-60	<16.7
----- <i>Thousand acres</i> -----						
Bolivar	66.3	...	4.1	24.9	37.3	...
Coahoma	56.6	...	4.0	40.4	12.1	...
Holmes	255.9	...	12.8	153.6	89.6	...
Humphreys ¹	99.2	...	8.3	49.6	41.3	...
Issaquena	98.4	...	...	65.6	21.9	10.9
Quitman ²	89.6	...	...	37.3	52.3	...
Sharkey	72.7	...	...	46.7	26.0	...
Sunflower ³	98.6	...	...	62.7	26.9	9.0
Tallahatchie	97.2	6.1	6.1	42.5	42.5	...
Warren	212.3	...	11.5	120.5	80.3	...
Yazoo	241.6	...	14.6	131.8	95.2	...
All counties	1388.3	6.1	61.4	775.6	525.3	19.9

¹ Leflore included in Humphreys.

² Tunica included in Quitman.

³ Washington included in Sunflower.

Table 7—Area of timberland by forest type and ownership class, Mississippi Delta, 1987

Forest type ¹	All ownerships	National forest	Other public	Forest industry	Forest industry- leased	Other private
	----- <i>Thousand acres</i> -----					
Loblolly-shortleaf pine	38.4	...	...	12.8	...	25.6
Softwood total	38.4	...	...	12.8	...	25.6
Oak-pine	57.9	...	...	...	...	57.9
Oak-hickory	451.7	...	18.8	33.2	...	399.7
Oak-gum-cypress	762.3	57.1	96.0	81.8	...	527.4
Elm-ash-cottonwood	78.0	...	...	4.1	...	73.9
Hardwood total	1349.9	57.1	114.8	119.1	...	1058.8
All types	1388.3	57.1	114.8	131.9	...	1084.4

¹ Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

Table 8—Area of timberland by ownership and stocking classes of growing-stock trees, Mississippi Delta, 1987

Ownership class	All classes	Stocking class (percent)				
		>130	100-130	60-100	16.7-60	<16.7
----- <i>Thousand acres</i> -----						
National forest	57.1	...	...	36.4	20.8	...
Other public	114.8	...	4.1	60.2	45.0	5.5
Forest industry	131.9	...	...	110.4	21.5	...
Other private	1084.4	6.1	57.3	568.6	438.1	14.4
All ownerships	1388.3	6.1	61.4	775.6	525.3	19.9

Table 9—Area of timberland by forest type and stand-size class, Mississippi Delta, 1987

Forest type ¹	All classes	Stand-size class			Nonstocked ² areas
		Sawtimber	Poletimber	Sapling- seedling	
		----- <i>Thousand acres</i> -----			
Loblolly-shortleaf pine	38.4	25.6	...	12.8	...
Softwood total	38.4	25.6	...	12.8	...
Oak-pine	57.9	12.5	32.6	12.8	...
Oak-hickory	451.7	309.3	109.5	32.9	...
Oak-gum-cypress	762.3	567.9	153.8	20.8	19.9
Elm-ash-cottonwood	78.0	53.2	24.8	...	...
Hardwood total	1349.9	942.8	320.7	66.5	19.9
All types	1388.3	968.4	320.7	79.3	19.9

¹ Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

² Timberland less than 16.7 percent stocked.

Table 10—Number of live trees on timberland by species and diameter class, Mississippi Delta, 1987

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----													
Shortleaf-loblolly pine	13484	4693	1760	1455	2739	1344	811	441	140	41	22	38	...
Cypress	2395	...	557	138	371	325	472	111	69	85	28	151	90
Other softwoods	11118	7850	1173	1275	586	113	25	...	60	36	...	...	...
Total softwoods	26998	12543	3490	2869	3696	1782	1308	552	268	162	50	188	90
Select white oaks	14039	7134	3369	982	591	546	576	269	192	123	81	163	12
Select red oaks	6175	1342	671	1165	1031	320	293	340	226	235	151	308	91
Other white oaks	21720	9247	4588	2672	1888	744	815	364	464	242	271	312	114
Other red oaks	40750	13819	7174	4791	3873	3254	1643	1886	1261	1006	602	1200	240
Hickory	78805	53497	12324	4036	2445	2120	1381	1081	623	507	342	419	29
Hard maple	7435	5315	1197	497	92	220	96	...	...	13	...	5	...
Soft maple	27276	11641	7692	2451	1668	1867	873	363	430	151	56	78	5
Beech	12970	8295	2249	850	648	182	80	150	132	118	89	151	26
Sweetgum	66157	28361	11811	8726	5604	4380	2663	2020	1200	661	247	425	58
Tupelo-blackgum	5040	1143	...	853	738	503	709	469	341	165	69	45	6
Ash	36295	20309	4474	3830	2380	1499	1048	1039	674	417	264	302	59
Cottonwood-aspen	2556	...	...	387	884	361	121	138	96	110	99	212	147
Basswood	3668	3065	...	...	138	146	123	118	60	...	...	17	...
Yellow-poplar	7876	5085	1113	209	337	238	242	106	182	149	92	106	18
Black walnut	760	...	526	131	...	56	...	21	16	...	10	...	...
Other hardwoods	202590	120596	37303	15195	10578	6958	3488	3251	2038	1378	826	865	114
Total hardwoods	534111	288850	94494	46774	32897	23393	14152	11614	7936	5275	3201	4608	918
Noncommercial	81389	54026	15110	8340	2308	1168	155	220	47	16	...	...	...
All species	642499	355419	113094	57982	38900	26343	15614	12386	8251	5453	3251	4796	1008

Table 11—Number of growing-stock trees on timberland by species and diameter class, Mississippi Delta, 1987

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
		-----Thousand trees-----											
Shortleaf-loblolly pine	11394	4107	587	1197	2684	1344	811	441	123	41	22	38	...
Cypress	1577	...	...	...	371	302	439	111	69	85	21	134	47
Other softwoods	10012	7263	1173	880	524	113	...	...	60	...	...	...	...
Total softwoods	22983	11370	1760	2076	3579	1758	1250	552	251	126	43	172	47
Select white oaks	7029	1258	2813	871	517	397	502	247	145	91	51	132	5
Select red oaks	4473	671	...	1053	1031	280	293	296	206	213	134	261	35
Other white oaks	8062	1578	1259	1243	1458	702	525	315	323	162	231	203	62
Other red oaks	25906	4499	4863	3940	3664	2659	1401	1607	1060	833	485	767	130
Hickory	21079	6865	3531	3082	2192	1776	1166	901	562	395	242	350	15
Hard maple	2572	1342	526	396	92	140	82	...	...	13	...	...	...
Soft maple	5647	671	957	1262	665	1218	342	206	161	102	23	39	...
Beech	2570	...	671	649	523	182	56	130	98	105	55	101	...
Sweetgum	31771	5328	5219	6476	4852	4020	2112	1679	993	564	184	315	29
Tupelo-blackgum	2201	...	...	193	257	466	394	348	324	141	58	21	...
Ash	16330	5754	2935	2077	1815	967	649	791	480	377	242	204	38
Cottonwood-aspen	2099	...	...	263	672	361	89	138	66	93	99	184	134
Basswood	361	...	...	...	60	146	25	93	20	...	...	17	...
Yellow-poplar	3875	1723	526	209	337	238	208	106	182	149	83	96	18
Black walnut	103	...	...	...	...	56	...	21	16	...	10	...	...
Other hardwoods	56554	13713	13146	8470	7774	5061	2366	2341	1378	1063	602	591	49
Total hardwoods	190632	43403	36446	30182	25910	18670	10189	9221	6014	4301	2498	3281	516
All species	213615	54773	38206	32258	29489	20428	11439	9774	6266	4427	2541	3452	562

Table 12—Volume of growing stock on timberland by species and diameter class, Mississippi Delta, 1987

Species	Diameter class (inches at breast height)										
	All classes	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million cubic feet -----											
Shortleaf-loblolly pine	78.4	4.2	17.2	17.6	16.2	12.5	3.6	1.9	1.6	3.7	...
Cypress	45.8	...	2.6	5.0	10.8	4.1	2.4	4.2	1.0	10.0	5.8
Other softwoods	8.6	2.3	3.3	1.2	...	...	1.8	...	...	...	...
Total softwoods	132.8	6.5	23.1	23.7	26.9	16.5	7.8	6.0	2.6	13.7	5.8
Select white oaks	51.6	2.3	3.9	4.2	9.7	6.6	5.7	4.2	3.1	11.2	0.9
Select red oaks	82.6	2.9	5.9	3.6	5.6	8.2	7.7	10.7	8.9	22.7	6.4
Other white oaks	84.3	2.4	7.6	6.9	8.3	7.0	9.2	6.7	11.1	16.5	8.6
Other red oaks	312.6	10.3	23.5	29.1	25.5	40.7	35.9	36.0	27.6	63.0	20.9
Hickory	171.3	8.7	13.6	20.0	22.4	23.2	20.1	17.9	13.8	28.5	3.3
Hard maple	5.4	1.0	0.7	1.8	1.5	...	...	0.4	...	...	...
Soft maple	42.7	2.9	4.2	11.9	5.4	5.0	5.6	4.2	0.9	2.6	...
Beech	30.9	1.4	2.9	2.1	1.1	3.3	3.4	5.2	3.5	8.1	...
Sweetgum	300.6	15.2	31.6	47.0	40.6	48.1	38.9	29.8	12.9	31.7	4.6
Tupelo-blackgum	42.5	0.5	1.5	5.2	7.0	8.9	9.9	5.3	2.8	1.4	...
Ash	117.8	5.1	11.1	9.9	10.7	18.9	15.2	16.1	12.4	13.7	4.7
Cottonwood-aspen	78.9	0.7	3.9	3.7	1.8	3.2	2.2	5.1	6.7	22.1	29.6
Basswood	7.7	...	0.5	1.6	0.7	2.4	0.7	...	...	1.8	...
Yellow-poplar	51.7	0.8	2.8	3.6	3.7	3.7	8.3	8.8	6.8	9.7	3.6
Black walnut	1.8	...	...	0.4	...	0.4	0.5	...	0.5	...	...
Other hardwoods	401.1	20.9	44.9	54.2	39.9	56.5	44.5	49.8	34.1	49.6	6.5
Total hardwoods	1783.6	74.8	158.5	205.1	183.9	236.1	207.9	200.2	145.0	282.7	89.2
All species	1916.3	81.4	181.6	228.8	210.8	252.7	215.7	206.3	147.7	296.4	95.0

Table 13—Volume of growing stock in the saw-log portion of sawtimber¹ trees on timberland by species and diameter class, Mississippi Delta, 1987

Species	Diameter class (inches at breast height)								
	All classes	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
-----Million cubic feet-----									
Shortleaf-loblolly pine	48.2	14.0	13.9	10.7	2.9	1.6	1.5	3.7	...
Cypress	39.0	3.5	9.3	3.7	2.2	4.0	0.9	9.7	5.8
Other softwoods	2.4	0.9	...	...	1.6	...	...	...	...
Total softwoods	89.6	18.4	23.2	14.4	6.6	5.6	2.4	13.3	5.8
Select white oaks	33.9	...	7.4	5.1	4.7	3.6	2.6	9.8	0.8
Select red oaks	60.2	...	4.1	6.9	6.5	9.4	7.9	20.4	4.9
Other white oaks	57.7	...	5.8	5.9	7.8	5.8	9.7	14.9	7.8
Other red oaks	214.6	...	18.5	34.0	31.6	30.6	23.5	56.7	19.7
Hickory	106.7	...	16.5	18.1	16.6	16.0	11.8	24.6	3.2
Hard maple	1.6	...	1.2	...	...	0.4	...	...	...
Soft maple	18.1	...	3.8	3.9	4.0	3.5	0.8	2.0	...
Beech	20.4	...	0.8	2.5	3.0	4.3	3.1	6.7	...
Sweetgum	172.7	...	28.2	39.6	34.0	26.3	11.3	28.9	4.3
Tupelo-blackgum	27.8	...	4.1	7.0	8.5	4.6	2.5	1.2	...
Ash	76.6	...	7.3	14.8	13.0	13.8	11.1	12.2	4.3
Cottonwood-aspen	64.5	...	1.0	2.7	1.9	4.6	6.3	20.4	27.8
Basswood	4.5	...	0.6	1.9	0.6	...	...	1.4	...
Yellow-poplar	39.2	...	2.4	3.1	7.5	8.1	6.2	8.8	3.1
Black walnut	1.3	...	...	0.4	0.5	...	0.4	...	...
Other hardwoods	236.8	...	27.8	45.1	38.0	44.1	31.3	44.3	6.3
Total hardwoods	1136.7	...	129.4	190.9	178.3	174.9	128.5	252.3	82.3
All species	1226.3	18.4	152.6	205.3	185.0	180.5	130.9	265.7	88.1

¹ That part of the bole of sawtimber trees between a 1-foot stump and saw-log top, including the portion of the forks large enough to contain a saw log.

Table 14—Volume of sawtimber on timberland by species and diameter class, Mississippi Delta, 1987

Species	Diameter class (inches at breast height)								
	All classes	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
-----Million board feet-----									
Shortleaf-loblolly pine	284.2	75.7	81.6	67.2	16.7	10.0	10.8	22.3	...
Cypress	227.9	18.3	52.3	22.8	12.6	23.5	5.3	57.9	35.3
Other softwoods	14.3	4.5	...	...	9.8	...	...	...	...
Total softwoods	526.4	98.5	133.8	89.9	39.1	33.5	16.0	80.2	35.3
Select white oaks	217.3	...	41.8	30.7	30.7	22.8	17.7	68.9	4.6
Select red oaks	387.9	...	23.8	40.5	39.8	60.5	51.2	137.1	35.1
Other white oaks	353.8	...	30.1	34.1	45.6	35.1	59.7	96.2	53.1
Other red oaks	1300.8	...	101.3	192.9	187.0	189.3	147.0	358.0	125.2
Hickory	668.2	...	93.2	108.2	102.6	101.2	76.4	164.2	22.2
Hard maple	9.6	...	7.5	...	...	2.0	...	...	...
Soft maple	112.3	...	21.7	24.8	26.3	22.3	4.8	12.4	...
Beech	133.2	...	4.6	15.4	18.6	29.1	21.1	44.4	...
Sweetgum	1039.2	...	157.6	231.0	207.4	162.0	71.9	185.6	23.8
Tupelo-blackgum	151.5	...	19.1	37.2	47.6	26.0	14.5	7.1	...
Ash	436.2	...	39.4	83.7	73.5	83.3	66.8	65.1	24.4
Cottonwood-aspen	427.4	...	5.7	15.5	11.8	28.7	40.9	137.8	187.2
Basswood	27.7	...	3.6	11.6	3.0	...	...	9.6	...
Yellow-poplar	251.2	...	13.6	19.6	47.6	51.5	41.7	58.6	18.6
Black walnut	7.5	...	...	2.2	2.8	...	2.5	...	...
Other hardwoods	1451.2	...	153.0	269.1	229.8	276.5	197.9	286.8	38.0
Total hardwoods	6975.0	...	716.1	1116.5	1073.9	1090.5	814.1	1631.8	532.1
All species	7501.4	98.5	849.9	1206.4	1113.0	1124.0	830.1	1712.1	567.4

Table 15—Volume of growing stock and sawtimber on timberland by county and species group, Mississippi Delta, 1987

County	Growing stock						Sawtimber							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard ²
-----Million cubic feet-----						-----Million board feet-----								
Bolivar	85.6	...	...	2.4	62.4	20.8	351.4	...	...	11.6	264.9	74.8		
Coahoma	94.9	...	...	5.6	52.5	36.9	408.4	...	...	34.2	209.4	164.7		
Holmes	281.3	14.1	47.7	2.0	95.3	122.2	879.1	58.5	151.4	2.6	273.7	392.9		
Humphreys ³	113.5	...	...	...	28.9	84.6	366.9	...	...	...	89.5	277.4		
Issaquena	146.8	...	...	3.3	83.8	59.8	614.4	...	...	18.3	316.6	279.5		
Quitman ⁴	100.8	...	...	4.4	64.3	32.0	419.1	...	...	24.3	274.4	120.3		
Sharkey	96.0	...	...	...	21.7	74.4	437.7	...	...	...	94.6	343.1		
Sunflower ⁵	124.3	...	...	7.8	72.5	44.0	464.8	...	...	38.2	279.0	147.7		
Tallahatchie	150.4	...	8.7	22.9	58.7	60.0	541.8	...	28.0	100.5	180.6	232.8		
Warren	367.9	...	7.4	0.2	189.0	171.4	1709.7	...	44.4	...	873.8	791.6		
Yazoo	354.7	...	0.5	5.9	158.0	190.3	1308.0	...	1.9	12.4	548.9	744.8		
All counties	1916.3	14.1	64.3	54.4	887.2	896.4	7501.4	58.5	225.7	242.2	3405.4	3569.6		

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

³ Leflore included in Humphreys.

⁴ Tunica included in Quitman.

⁵ Washington included in Sunflower.

**Table 16—Volume of timber on timberland by class of timber and species group,
Mississippi Delta, 1987**

Class of timber	All species	Softwood			Hardwood	
		Pine			Soft ¹	Hard ²
		Planted	Natural	Other		
----- Million cubic feet -----						
Sawtimber trees:						
Saw-log portion	1226.3	10.2	38.0	41.5	554.2	582.4
Upper-stem portion	221.9	2.1	6.7	4.7	101.1	107.4
Total	1448.3	12.3	44.7	46.2	655.3	689.8
Poletimber trees	468.1	1.8	19.6	8.2	231.9	206.6
All growing-stock trees	1916.3	14.1	64.3	54.4	887.2	896.4
Rough trees:						
Sawtimber size	252.6	...	0.6	6.2	126.6	119.2
Poletimber size	131.6	0.6	0.7	1.0	51.2	78.1
Total	384.2	0.6	1.3	7.2	177.8	197.4
Rotten trees:						
Sawtimber size	83.6	...	...	4.7	30.8	48.0
Poletimber size	6.0	...	...	...	3.1	2.9
Total	89.6	...	...	4.7	33.9	50.9
Salvable dead trees:						
Sawtimber size	6.8	0.5	...	1.0	3.0	2.2
Poletimber size	2.2	...	0.3	0.6	0.4	1.0
Total	8.9	0.5	0.3	1.6	3.4	3.2
All classes	2399.1	15.2	65.8	67.9	1102.3	1147.8

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 17—Volume of live trees and growing stock on timberland by ownership class and species group, Mississippi Delta, 1987

Ownership class	Live trees						Growing stock					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
-----Million cubic feet-----												
National forest	97.9	...	...	0.3	17.1	80.5	80.7	...	...	...	11.6	69.1
Other public	203.3	...	...	7.7	82.8	112.8	162.6	...	...	6.9	65.7	90.1
Forest industry	245.4	2.2	6.9	1.3	154.6	80.3	199.0	1.6	6.9	1.3	125.1	64.1
Other private	1843.6	12.5	58.7	56.9	844.4	871.1	1473.9	12.5	57.4	46.2	684.8	673.1
All ownerships	2390.1	14.7	65.6	66.3	1098.9	1144.7	1916.3	14.1	64.3	54.4	887.2	896.4

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 18—Average net annual growth of growing stock and sawtimber on timberland by county and species group, Mississippi Delta, 1987

County	Growing stock						Sawtimber							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard ²
-----Million cubic feet-----														
Bolivar	2.1	...	...	0.2	1.0	0.9	10.1	...	...	0.8	5.7	3.7		
Coahoma	1.0	...	...	-0.2	0.5	0.7	6.8	...	...	-1.3	4.0	4.1		
Holmes	16.1	1.6	2.9	0.3	4.6	6.7	57.6	5.9	12.7	0.3	13.8	24.9		
Humphreys ³	6.1	...	...	...	1.0	5.2	21.9	...	...	...	4.8	17.2		
Issaquena	5.6	...	...	...	3.1	2.5	21.7	...	...	-0.2	10.7	11.1		
Quitman ⁴	3.6	...	...	0.1	2.1	1.4	17.5	...	...	0.5	11.1	5.8		
Sharkey	2.8	...	...	...	0.3	2.5	7.5	...	...	-0.2	-0.4	8.1		
Sunflower ⁵	6.1	...	...	0.2	3.5	2.4	25.3	...	...	1.2	15.2	8.9		
Tallahatchie	4.7	0.6	...	0.1	1.8	2.1	23.2	2.7	...	1.4	7.6	11.5		
Warren	11.2	...	0.4	...	4.5	6.3	62.2	...	2.3	-0.2	25.9	34.2		
Yazoo	15.3	...	...	0.4	7.3	7.6	66.1	...	0.1	0.9	28.2	36.9		
All counties	74.7	2.2	3.3	1.0	29.7	38.4	319.9	8.6	15.2	3.1	126.6	166.3		

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

³ Leflore included in Humphreys.

⁴ Tunica included in Quitman.

⁵ Washington included in Sunflower.

Table 19—Average net annual removals of growing stock and sawtimber on timberland by county and species group, Mississippi Delta, 1987

County	Growing stock						Sawtimber					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Soft ¹	Hard ²	
		Planted	Natural					Planted	Natural			Other
-----Million cubic feet-----												
Bolivar	2.1	...	...	...	1.2	0.9	9.2	...	...	...	6.0	3.1
Coahoma	0.7	...	...	...	0.4	0.3	3.2	...	...	...	2.6	0.6
Holmes	7.3	2.1	1.5	0.1	0.8	2.7	20.0	4.6	4.3	...	1.4	9.6
Humphreys ³	1.2	...	...	...	0.3	0.9	3.6	...	...	...	1.1	2.5
Issaquena	3.8	...	...	...	1.9	1.9	19.9	...	...	...	7.2	12.7
Quitman ⁴	0.6	...	...	...	0.5	0.1	3.4	...	...	...	3.1	0.2
Sharkey	1.3	...	...	...	0.2	1.1	7.1	...	...	...	1.1	6.0
Sunflower ⁵	1.9	...	...	1.2	0.1	0.6	8.1	...	...	5.8	0.7	1.6
Tallahatchie	1.0	...	0.1	...	0.4	0.5	3.5	...	0.6	...	1.1	1.8
Warren	8.0	...	...	0.1	4.0	4.0	39.2	...	...	0.3	19.8	19.1
Yazoo	4.8	...	0.1	...	1.5	3.2	21.8	...	0.5	...	6.9	14.4
All counties	32.8	2.1	1.7	1.4	11.5	16.1	138.7	4.6	5.3	6.1	51.1	71.6

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

³ Leflore included in Humphreys.

⁴ Tunica included in Quitman.

⁵ Washington included in Sunflower.

Table 20—Average net annual growth and average annual removals of growing stock on timberland by species, Mississippi Delta, 1987

Species	Growth	Removals
- - - - Million cubic feet - - - -		
Yellow pines	5.5	3.8
Other softwoods	1.0	1.4
Total softwoods	6.5	5.2
Select white-red oaks	6.8	3.3
Other white-red oaks	18.5	10.0
Hickory	5.3	1.7
Hard maple	0.2	0.1
Sweetgum	12.1	3.5
Ash-walnut-black cherry	4.7	0.9
Yellow-poplar	2.5	0.9
Other hardwoods	17.9	7.3
Total hardwoods	68.1	27.6
All species	74.7	32.8

Table 21—Average net annual growth and average annual removals of sawtimber on timberland by species, Mississippi Delta, 1987

Species	Growth	Removals
- - - - Million board feet - - - -		
Yellow pines	23.8	9.9
Other softwoods	3.1	6.1
Total softwoods	26.9	16.0
Select white-red oaks	33.1	14.4
Other white-red oaks	81.1	45.0
Hickory	22.4	8.4
Hard maple	0.4	0.4
Sweetgum	47.0	13.5
Ash-walnut-black cherry	20.7	2.9
Yellow-poplar	11.8	4.7
Other hardwoods	76.6	33.3
Total hardwoods	293.0	122.7
All species	319.9	138.7

Table 22—Average annual mortality of growing stock and sawtimber on timberland by species, Mississippi Delta, 1987

Species	Growing stock	Sawtimber
- - Million cubic feet - - Million board feet - -		
Yellow pines	0.6	0.9
Other softwoods	0.3	0.7
Total softwoods	1.0	1.6
Select white-red oaks	0.2	0.2
Other white-red oaks	2.4	8.6
Hickory	1.6	7.8
Sweetgum	1.4	5.1
Ash-walnut-black cherry	0.5	1.5
Yellow-poplar	0.1	0.6
Other hardwoods	8.6	34.1
Total hardwoods	14.9	57.8
All species	15.8	59.4

Table 23—Average net annual growth and average annual removals of growing stock on timberland by ownership class and species group, Mississippi Delta, 1987

Ownership class	Growth						Removals					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
----- Million cubic feet -----												
National forest	2.4	...	...	...	0.2	2.3	1.0	...	...	...	0.2	0.8
Other public	4.2	...	...	...	1.4	2.8	0.5	...	...	...	0.3	0.2
Forest industry	8.6	0.6	0.5	0.1	4.6	2.8	8.9	2.0	...	...	4.1	2.8
Other private	59.5	1.7	2.8	1.0	23.5	30.5	22.4	0.1	1.7	1.4	6.9	12.3
All ownerships	74.7	2.2	3.3	1.0	29.7	38.4	32.8	2.1	1.7	1.4	11.5	16.1

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 24—Average net annual growth and average annual removals of sawtimber on timberland by ownership class and species, Mississippi Delta, 1987

Ownership class	Growth						Removals					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
----- Million board feet -----												
National forest	6.0	...	...	0.2	-0.5	6.7	5.3	...	...	...	1.1	4.1
Other public	20.3	...	...	0.2	6.5	14.0	1.6	...	...	...	0.9	0.7
Forest industry	40.0	2.0	2.7	0.3	19.8	15.2	43.3	4.6	...	...	21.1	17.6
Other private	253.7	6.6	12.5	3.3	100.8	130.4	88.5	...	5.3	6.1	28.0	49.1
All ownerships	319.9	8.6	15.2	3.1	126.6	166.3	138.7	4.6	5.3	6.1	51.1	71.6

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

**Table 25—Volume of sawtimber on timberland by species and tree grade,
Mississippi Delta, 1987**

Species	All grades	Grade 1	Grade 2	Grade 3	Grade 4
----- Million board feet -----					
Yellow pines	284.2	8.3	44.6	231.3	...
Cypress	227.9	3.2	40.3	184.3	...
Redcedar	14.3	14.3	...	...	...
Total softwoods	526.4	25.8	84.9	415.6	...
Select white-red oaks	605.2	120.5	158.9	221.8	104.0
Other white-red oaks	1654.7	132.1	345.1	606.7	570.8
Hickory	668.2	64.1	136.1	349.9	118.1
Hard maple	9.6	...	...	2.0	7.5
Sweetgum	1039.2	110.3	331.1	440.4	157.4
Tupelo and blackgum	151.5	2.8	34.5	107.1	7.0
Ash-walnut-black cherry	467.0	91.3	182.0	179.2	14.6
Yellow-poplar	251.2	15.5	55.6	138.1	41.9
Other hardwoods	2128.4	414.5	531.5	759.1	423.3
Total hardwoods	6975.0	951.1	1774.8	2804.4	1444.6
All species	7501.4	977.0	1859.8	3220.0	1444.6

Supplemental Tables 26–36

**Table 26—Area of timberland by stand age, forest type group and type of regeneration,
Mississippi Delta, 1987**

Stand age class	Pine		Oak-pine		Other hardwood types	
	Artificial	Natural	Artificial	Natural	Artificial	Natural
----- Thousand acres -----						
1-10	12.8	...	...	...	5.5	5.5
11-20	...	...	...	...	...	...
21-30	...	...	...	...	...	5.7
31-40	...	...	6.4	...	...	...
41-50	...	...	...	...	...	21.3
>50	...	...	...	...	...	17.2
Mixed	6.4	19.2	...	51.5	6.4	1230.5
Total	19.2	19.2	6.4	51.5	11.9	1280.2

Table 27—Volume of softwood growing stock on timberland by forest type, Mississippi Delta, 1987

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-Gum- Cypress	Elm-Ash- Cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Bolivar	2.4	...	...	...	...	0.9	1.5
Coahoma	5.6	...	...	...	...	5.1	0.5
Holmes	63.8	7.8	17.8	26.0	11.7	0.4	...
Humphreys ¹	...	...	...	...	...	...	...
Issaquena	3.3	...	...	...	...	3.3	...
Quitman ²	4.4	...	...	...	...	4.4	...
Sharkey	...	...	...	...	...	...	...
Sunflower ³	7.8	...	...	...	...	7.8	...
Tallahatchie	31.6	...	...	8.7	0.7	22.2	...
Warren	7.5	...	...	...	7.4	...	0.2
Yazoo	6.4	...	...	3.2	2.0	1.2	...
All counties	132.8	7.8	17.8	38.0	21.8	45.2	2.1

¹ Leflore included in Humphreys.

² Tunica included in Quitman.

³ Washington included in Sunflower.

Table 28—Volume of hardwood growing stock on timberland by forest type, Mississippi Delta, 1987

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-Gum- Cypresss	Elm-Ash- Cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Bolivar	83.2	...	...	...	3.2	57.8	22.1
Coahoma	89.4	...	...	...	...	83.5	5.8
Holmes	217.5	3.3	3.8	21.5	95.6	93.4	...
Humphreys ¹	113.5	...	...	...	...	113.5	...
Issaquena	143.5	...	...	...	7.2	136.3	...
Quitman ²	96.4	...	...	...	...	81.4	14.9
Sharkey	96.0	...	...	...	...	96.0	...
Sunflower ³	116.6	...	...	...	...	91.7	24.9
Tallahatchie	118.7	...	...	2.4	51.7	64.6	...
Warren	360.4	...	...	...	200.9	123.4	36.1
Yazoo	348.4	...	...	5.7	209.1	119.2	14.4
All counties	1783.6	3.3	3.8	29.6	567.6	1061.0	118.3

¹ Leflore included in Humphreys.

² Tunica included in Quitman.

³ Washington included in Sunflower.

Table 29—Volume of softwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, Mississippi Delta, 1987

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-Gum- Cypress	Elm-Ash- Cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Bolivar	2.2	...	...	...	...	0.8	1.3
Coahoma	5.0	...	...	...	...	4.5	0.5
Holmes	36.1	6.1	9.3	12.7	8.0	...	...
Humphreys ¹	...	...	...	...	...	...	...
Issaquena	3.2	...	...	...	...	3.2	...
Quitman ²	4.0	...	...	...	...	4.0	...
Sharkey	...	...	...	...	...	...	...
Sunflower ³	7.0	...	...	...	...	7.0	...
Tallahatchie	22.6	...	...	5.2	0.3	17.2	...
Warren	7.0	...	...	...	7.0	...	...
Yazoo	2.5	...	...	0.6	0.9	1.1	...
All counties	89.6	6.1	9.3	18.4	16.2	37.8	1.8

¹ Leflore included in Humphreys.

² Tunica included in Quitman.

³ Washington included in Sunflower.

Table 30—Volume of hardwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, Mississippi Delta, 1987

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-Gum- Cypress	Elm-Ash- Cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Bolivar	56.3	...	...	...	2.0	38.3	16.0
Coahoma	59.6	...	...	...	...	56.0	3.6
Holmes	110.8	0.3	2.6	6.9	50.3	50.8	...
Humphreys ¹	62.6	...	...	...	...	62.6	...
Issaquena	98.9	...	...	...	0.3	98.6	...
Quitman ²	64.1	...	...	...	...	56.7	7.4
Sharkey	71.5	...	...	...	...	71.5	...
Sunflower ³	70.8	...	...	...	...	50.3	20.5
Tallahatchie	69.9	...	...	1.3	30.7	37.9	...
Warren	267.9	...	...	...	143.1	94.0	30.8
Yazoo	204.2	...	...	3.0	117.1	75.5	8.6
All counties	1136.7	0.3	2.6	11.2	343.5	692.1	87.0

¹ Leflore included in Humphreys.

² Tunica included in Quitman.

³ Washington included in Sunflower.

Table 31—*Volume of timber on timberland by county, class of timber and species group, Mississippi Delta, 1987*

County	All classes	Growing stock		Rough		Rotten	
		Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
-----Million cubic feet-----							
Bolivar	111.3	2.4	83.2	...	24.0	...	1.7
Coahoma	121.3	5.6	89.4	1.6	23.5	...	1.2
Holmes	348.4	63.8	217.5	1.4	59.2	...	6.5
Humphreys ¹	141.5	...	113.5	...	19.7	...	8.2
Issaquena	197.6	3.3	143.5	2.0	35.5	1.3	12.0
Quitman ²	131.5	4.4	96.4	0.7	25.2	...	4.8
Sharkey	117.4	...	96.0	...	15.9	0.3	5.1
Sunflower ³	148.4	7.8	116.6	0.5	18.4	1.9	3.3
Tallahatchie	181.3	31.6	118.7	1.2	22.5	0.2	6.9
Warren	443.8	7.5	360.4	1.4	61.6	...	12.9
Yazoo	447.8	6.4	348.4	0.2	69.6	0.9	22.3
All counties	2390.1	132.8	1783.6	9.1	375.2	4.7	84.8

¹ Leflore included in Humphreys.

² Tunica included in Quitman.

³ Washington included in Sunflower.

Table 32—Number of live trees on timberland by detailed species and diameter class, Mississippi Delta, 1987

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----													
Shortleaf pine	5672	587	587	988	1834	716	562	301	88	...	10	...	...
Loblolly pine	7812	4107	1173	468	905	628	249	140	52	41	12	38	...
Redcedar	11118	7850	1173	1275	586	113	25	...	60	36	...	...	...
Cypress	2395	...	557	138	371	325	472	111	69	85	28	151	90
Total softwoods	26998	12543	3490	2869	3696	1782	1308	552	268	162	50	188	90
Select white oaks	14039	7134	3369	982	591	546	576	269	192	123	81	163	12
Select red oaks	6175	1342	671	1165	1031	320	293	340	226	235	151	308	91
Other white oaks	21720	9247	4588	2672	1888	744	815	364	464	242	271	312	114
Other red oaks	40750	13819	7174	4791	3873	3254	1643	1886	1261	1006	602	1200	240
Sweet pecan	5394	2380	751	564	405	584	228	117	92	58	65	128	21
Water hickory	44151	30287	8211	1875	1256	668	424	491	294	279	173	186	8
Other hickories	29260	20830	3363	1598	784	868	730	473	237	170	103	105	...
Persimmon	16944	9803	4227	1298	825	569	123	45	14	29	10	...	...
Hard maple	7435	5315	1197	497	92	220	96	...	...	13	...	5	...
Soft maple	14073	5938	5895	845	759	274	117	91	72	46	8	24	5
Boxelder	13203	5702	1797	1606	909	1593	756	273	358	105	48	54	...
Beech	12970	8295	2249	850	648	182	80	150	132	118	89	151	26
Sweetgum	66157	28361	11811	8726	5604	4380	2663	2020	1200	661	247	425	58
Blackgum	1949	1143	...	190	274	97	58	66	52	57	...	11	...
Other gums/tupelos	3091	...	...	662	464	406	650	403	289	107	69	34	6
White ash	7416	6023	...	308	277	229	110	181	31	156	87	15	...
Other ashes	28879	14287	4474	3522	2104	1270	938	857	643	261	177	287	59
Sycamore	4489	1113	557	385	893	308	126	297	318	171	117	178	25
Cottonwood	2556	...	...	387	884	361	121	138	96	110	99	212	147
Basswood	3668	3065	...	...	138	146	123	118	60	...	...	17	...
Yellow-poplar	7876	5085	1113	209	337	238	242	106	182	149	92	106	18
Magnolia	52	...	...	...	...	...	35	...	...	11	...	6	...
Willow	5697	2347	380	1054	377	244	228	278	161	221	178	163	65
Black walnut	760	...	526	131	...	56	...	21	16	...	10	...	...
Black cherry	3165	1929	587	179	269	...	70	42	39	38	...	12	...
American elm	32504	19926	6881	1436	1925	1020	356	501	157	114	70	108	9
Other elms	31223	24975	3101	1325	502	476	135	269	140	93	81	121	4
Hackberry	59467	29333	11608	5370	3960	3456	2060	1436	1070	600	311	257	6
Black locust	904	526	...	117	68	97	58	37	...	...	...	...	...
Other locusts	1832	1173	...	...	215	238	60	52	28	38	23	5	...
Sassafras	6185	2341	1669	504	783	348	121	202	110	54	35	14	5
Dogwood	33978	23116	7623	2759	480	...	...	...	...	...	...	...	...
Holly	75	...	...	...	...	33	42	...	...	...	...	...	...
Other commercial	6077	4013	671	767	282	168	75	92	...	8	...	...	...
Total hardwoods	534111	288850	94494	46774	32897	23393	14152	11614	7936	5275	3201	4608	918
Noncommercial	81389	54026	15110	8340	2308	1168	155	220	47	16	...	...	...
All species	642499	355419	113094	57982	38900	26343	15614	12386	8251	5453	3251	4796	1008

Table 33—Number of growing-stock trees on timberland by detailed species and diameter class, Mississippi Delta, 1987

Species	All classes	Diameter class (inches at breast height)									
		5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
		-----Thousand trees-----									
Shortleaf pine	4345	890	1779	716	562	301	88	...	10	...	...
Loblolly pine	2355	307	905	628	249	140	35	41	12	38	...
Redcedar	1576	880	524	113	...	...	60	...	...	...	...
Cypress	1577	...	371	302	439	111	69	85	21	134	47
Total softwoods	9853	2076	3579	1758	1250	552	251	126	43	172	47
Select white oaks	2958	871	517	397	502	247	145	91	51	132	5
Select red oaks	3802	1053	1031	280	293	296	206	213	134	261	35
Other white oaks	5225	1243	1458	702	525	315	323	162	231	203	62
Other red oaks	16543	3940	3664	2659	1401	1607	1060	833	485	767	130
Sweet pecan	1901	564	227	520	186	103	92	50	28	116	15
Water hickory	4362	1295	1180	509	314	348	233	191	133	158	...
Other hickories	4420	1223	784	747	667	451	237	155	81	76	...
Persimmon	2279	1093	573	490	68	21	14	10	10	...	...
Hard maple	703	396	92	140	62	...	...	13	...	...	...
Soft maple	1076	422	211	274	34	52	21	31	8	24	...
Boxelder	2942	840	454	944	308	155	140	71	15	16	...
Beech	1899	649	523	182	56	130	98	105	55	101	...
Sweetgum	21224	6476	4852	4020	2112	1679	993	564	184	315	29
Blackgum	508	103	133	97	27	40	52	45	...	11	...
Other gums/tupelos	1693	90	123	369	367	308	272	95	58	10	...
White ash	1049	96	277	168	110	130	31	156	74	7	...
Other ashes	6592	1981	1539	800	539	662	449	221	168	196	38
Sycamore	2367	305	831	211	126	231	244	142	100	164	14
Cottonwood	2099	263	672	361	89	138	66	93	99	184	134
Basswood	361	...	60	146	25	93	20	...	...	17	...
Yellow-poplar	1626	209	337	238	208	106	182	149	83	96	18
Magnolia	35	...	...	...	35	...	...	...	...	...	...
Willow	1567	217	147	194	187	173	115	197	150	151	35
Black walnut	103	...	...	56	...	21	16	...	10	...	...
Black cherry	407	179	83	...	38	42	39	26	...	...	...
American elm	4269	795	1811	750	213	422	127	63	33	55	...
Other elms	2149	837	268	441	108	198	113	55	45	85	...
Hackberry	12487	3048	3074	2435	1363	1020	682	493	236	135	...
Black locust	329	117	68	49	58	37	...	...	...	...	...
Other locusts	391	...	72	145	60	31	28	38	17	...	...
Sassafras	1362	292	507	263	69	167	16	39	10	...	...
Dogwood	1558	1218	340	...	...	...	...	...	...	...	...
Holly	75	...	...	33	42	...	...	...	...	...	...
Other commercial	419	369	...	50	...	...	...	...	...	...	...
Total hardwoods	110782	30182	25910	18670	10189	9221	6014	4301	2498	3281	516
All species	120636	32258	29489	20428	11439	9774	6266	4427	2541	3452	562

Table 34—Volume of growing-stock trees on timberland by species and diameter class, Mississippi Delta, 1987

Species	All classes	Diameter class (inches at breast height)									
		5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Million cubic feet-----											
Shortleaf pine	49.9	3.6	12.2	9.6	12.0	9.2	2.4	...	0.9	...	...
Loblolly pine	28.5	0.6	5.0	8.0	4.2	3.3	1.2	1.9	0.7	3.7	...
Redcedar	8.6	2.3	3.3	1.2	...	...	1.8	...	...	...	...
Cypress	45.8	...	2.6	5.0	10.8	4.1	2.4	4.2	1.0	10.0	5.8
Total softwoods	132.8	6.5	23.1	23.7	26.9	16.5	7.8	6.0	2.6	13.7	5.8
Select white oaks	51.6	2.3	3.9	4.2	9.7	6.6	5.7	4.2	3.1	11.2	0.9
Select red oaks	82.6	2.9	5.9	3.6	5.6	8.2	7.7	10.7	8.9	22.7	6.4
Other white oaks	84.3	2.4	7.6	6.9	8.3	7.0	9.2	6.7	11.1	16.5	8.6
Other red oaks	312.6	10.3	23.5	29.1	25.5	40.7	35.9	36.0	27.6	63.0	20.9
Sweet pecan	35.2	1.2	1.5	5.4	3.9	2.6	3.4	1.9	1.8	10.1	3.3
Water hickory	62.4	3.9	6.4	4.6	4.3	8.5	7.6	8.2	7.0	11.9	...
Other hickories	73.8	3.5	5.6	10.0	14.2	12.1	9.1	7.8	4.9	6.5	...
Persimmon	16.4	3.2	3.3	6.4	1.4	0.5	0.5	0.5	0.6	...	...
Hard maple	5.4	1.0	0.7	1.8	1.5	...	...	0.4	...	...	...
Soft maple	11.5	0.9	1.5	2.6	0.4	1.7	0.7	1.7	0.3	1.8	...
Boxelder	31.1	2.0	2.7	9.3	5.0	3.3	4.9	2.5	0.6	0.8	...
Beech	30.9	1.4	2.9	2.1	1.1	3.3	3.4	5.2	3.5	8.1	...
Sweetgum	300.6	15.2	31.6	47.0	40.6	48.1	38.9	29.8	12.9	31.7	4.6
Blackgum	7.8	0.2	0.7	0.8	0.5	1.1	2.0	1.7	...	0.8	...
Other gums/tupelos	34.7	0.3	0.8	4.3	6.6	7.8	8.0	3.6	2.8	0.6	...
White ash	23.3	0.4	2.3	1.7	1.8	3.5	1.0	7.5	4.3	0.8	...
Other ashes	94.5	4.7	8.8	8.1	9.0	15.4	14.2	8.6	8.1	12.9	4.7
Sycamore	59.7	0.7	6.2	2.9	2.9	7.3	9.1	7.3	6.3	15.1	2.0
Cottonwood	78.9	0.7	3.9	3.7	1.8	3.2	2.2	5.1	6.7	22.1	29.6
Basswood	7.7	...	0.5	1.6	0.7	2.4	0.7	...	...	1.8	...
Yellow-poplar	51.7	0.8	2.8	3.6	3.7	3.7	8.3	8.8	6.8	9.7	3.6
Magnolia	0.5	...	...	...	0.5	...	...	...	...	...	...
Willow	55.3	0.6	0.5	1.6	2.8	5.0	5.0	11.4	9.8	14.2	4.5
Black walnut	1.8	...	...	0.4	...	0.4	0.5	...	0.5	...	...
Black cherry	5.5	0.4	0.5	...	0.7	1.4	1.1	1.4	...	...	...
American elm	44.8	1.9	10.5	7.6	3.7	9.8	4.3	2.5	1.6	2.9	...
Other elms	32.4	1.9	1.7	5.1	2.0	4.7	3.7	2.3	2.6	8.5	...
Hackberry	154.5	7.6	16.9	25.1	22.0	22.1	19.6	20.6	11.6	9.0	...
Black locust	2.9	0.3	0.4	0.4	1.0	0.9	...	...	...	...	...
Other locusts	7.4	...	0.4	1.6	1.3	0.6	0.8	1.7	1.0	...	...
Sassafras	15.2	0.8	3.2	2.5	1.3	4.4	0.4	1.9	0.7	...	...
Dogwood	3.8	2.5	1.3	...	...	...	...	...	...	...	...
Holly	1.0	...	...	0.4	0.5	...	...	...	...	...	...
Other commercial	1.7	1.1	...	0.6	...	...	...	...	...	...	...
Total hardwoods	1783.6	74.8	158.5	205.1	183.9	236.1	207.9	200.2	145.0	282.7	89.2
All species	1916.3	81.4	181.6	228.8	210.8	252.7	215.7	206.3	147.7	296.4	95.0

Table 35—Volume of growing stock in the saw-log portion of sawtimber trees on timberland by detailed species and diameter class, Mississippi Delta, 1987

Species	Diameter class (inches at breast height)								
	All classes	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
----- Million cubic feet -----									
Shortleaf pine	29.1	7.7	10.5	8.1	2.0	...	0.9	...	...
Loblolly pine	19.1	6.3	3.4	2.6	0.9	1.6	0.6	3.7	...
Redcedar	2.4	0.9	...	...	1.6	...	...	...	...
Cypress	39.0	3.5	9.3	3.7	2.2	4.0	0.9	9.7	5.8
Total softwoods	89.6	18.4	23.2	14.4	6.6	5.6	2.4	13.3	5.8
Select white oaks	33.9	...	7.4	5.1	4.7	3.6	2.6	9.8	0.8
Select red oaks	60.2	...	4.1	6.9	6.5	9.4	7.9	20.4	4.9
Other white oaks	57.7	...	5.8	5.9	7.8	5.8	9.7	14.9	7.8
Other red oaks	214.6	...	18.5	34.0	31.6	30.6	23.5	56.7	19.7
Sweet pecan	23.1	...	3.0	2.1	2.7	1.6	1.6	8.8	3.2
Water hickory	39.8	...	3.2	6.5	6.4	7.3	6.1	10.3	...
Other hickories	43.9	...	10.3	9.5	7.5	7.0	4.1	5.5	...
Persimmon	2.7	...	0.8	0.5	0.4	0.4	0.6	...	...
Hard maple	1.6	...	1.2	...	...	0.4	...	...	...
Soft maple	5.6	...	0.3	1.4	0.5	1.6	0.2	1.5	...
Boxelder	12.5	...	3.5	2.5	3.5	1.9	0.6	0.5	...
Beech	20.4	...	0.8	2.5	3.0	4.3	3.1	6.7	...
Sweetgum	172.7	...	28.2	39.6	34.0	26.3	11.3	28.9	4.3
Blackgum	5.2	...	0.3	0.9	1.8	1.4	...	0.7	...
Other gums/tupelos	22.6	...	3.7	6.0	6.7	3.1	2.5	0.5	...
White ash	15.1	...	1.3	2.6	0.6	5.9	3.8	0.8	...
Other ashes	61.5	...	6.0	12.2	12.4	7.9	7.2	11.4	4.3
Sycamore	43.4	...	2.2	5.6	8.1	6.3	5.7	13.6	1.9
Cottonwood	64.5	...	1.0	2.7	1.9	4.6	6.3	20.4	27.8
Basswood	4.5	...	0.6	1.9	0.6	...	...	1.4	...
Yellow-poplar	39.2	...	2.4	3.1	7.5	8.1	6.2	8.8	3.1
Magnolia	0.3	...	0.3	...	...	...	...	...	...
Willow	48.3	...	2.0	4.3	4.5	11.0	9.1	13.1	4.4
Black walnut	1.3	...	...	0.4	0.5	...	0.4	...	...
Black cherry	3.7	...	0.5	1.2	0.8	1.2	...	...	...
American elm	19.8	...	2.6	7.7	3.4	2.0	1.6	2.6	...
Other elms	19.3	...	1.5	3.6	3.2	1.8	2.2	7.0	...
Hackberry	86.2	...	15.3	17.4	16.6	18.2	10.6	8.0	...
Black locust	1.4	...	0.6	0.7	...	...	...	...	...
Other locusts	4.2	...	0.9	0.5	0.6	1.4	0.8	...	...
Sassafras	7.2	...	0.9	3.7	0.3	1.7	0.7	...	...
Holly	0.3	...	0.3	...	...	...	...	...	...
Total hardwoods	1136.7	...	129.4	190.9	178.3	174.9	128.5	252.3	82.3
All species	1226.3	18.4	152.6	205.3	185.0	180.5	130.9	265.7	88.1

**Table 36—Volume of timber on timberland by species and class of timber,
Mississippi Delta, 1987**

Species	All live	Growing stock	Rough	Rotten
----- Million cubic feet -----				
Shortleaf pine	50.9	49.9	1.1	...
Loblolly pine	29.3	28.5	0.8	...
Redcedar	11.0	8.6	2.2	0.2
Cypress	55.3	45.8	5.0	4.5
Total softwoods	146.6	132.8	9.1	4.7
Select white oaks	60.7	51.6	6.2	2.9
Select red oaks	96.4	82.6	9.6	4.2
Other white oaks	108.5	84.3	15.2	9.0
Other red oaks	378.5	312.6	45.5	20.4
Sweet pecan	40.9	35.2	5.7	...
Water hickory	78.5	62.4	12.7	3.4
Other hickories	80.3	73.8	6.2	0.4
Persimmon	19.9	16.4	3.1	0.4
Hard maple	6.9	5.4	1.5	...
Soft maple	17.1	11.5	5.0	0.6
Boxelder	58.2	31.1	25.2	1.9
Beech	41.1	30.9	5.4	4.8
Sweetgum	353.9	300.6	41.3	12.0
Blackgum	9.3	7.8	1.3	0.3
Other gums/tupelos	45.2	34.7	9.5	1.0
White ash	26.4	23.3	2.3	0.8
Other ashes	125.3	94.5	27.9	3.0
Sycamore	71.1	59.7	9.6	1.8
Cottonwood	84.6	78.9	3.8	1.9
Basswood	11.6	7.7	3.2	0.7
Yellow-poplar	54.2	51.7	2.5	...
Magnolia	1.4	0.5	0.9	...
Willow	65.9	55.3	8.2	2.5
Black walnut	2.0	1.8	0.1	...
Black cherry	7.3	5.5	1.7	0.1
American elm	57.2	44.8	10.8	1.7
Other elms	41.3	32.4	7.2	1.7
Hackberry	204.7	154.5	46.8	3.3
Black locust	3.3	2.9	0.3	...
Other locusts	9.9	7.4	2.5	...
Sassafras	25.1	15.2	4.9	5.0
Dogwood	6.8	3.8	3.0	...
Holly	1.0	1.0	...	...
Other commercial	6.4	1.7	3.5	1.2
Total hardwoods	2201.1	1783.6	332.7	84.8
Noncommercial	42.5	...	42.5	...
All species	2390.1	1916.3	384.2	89.6

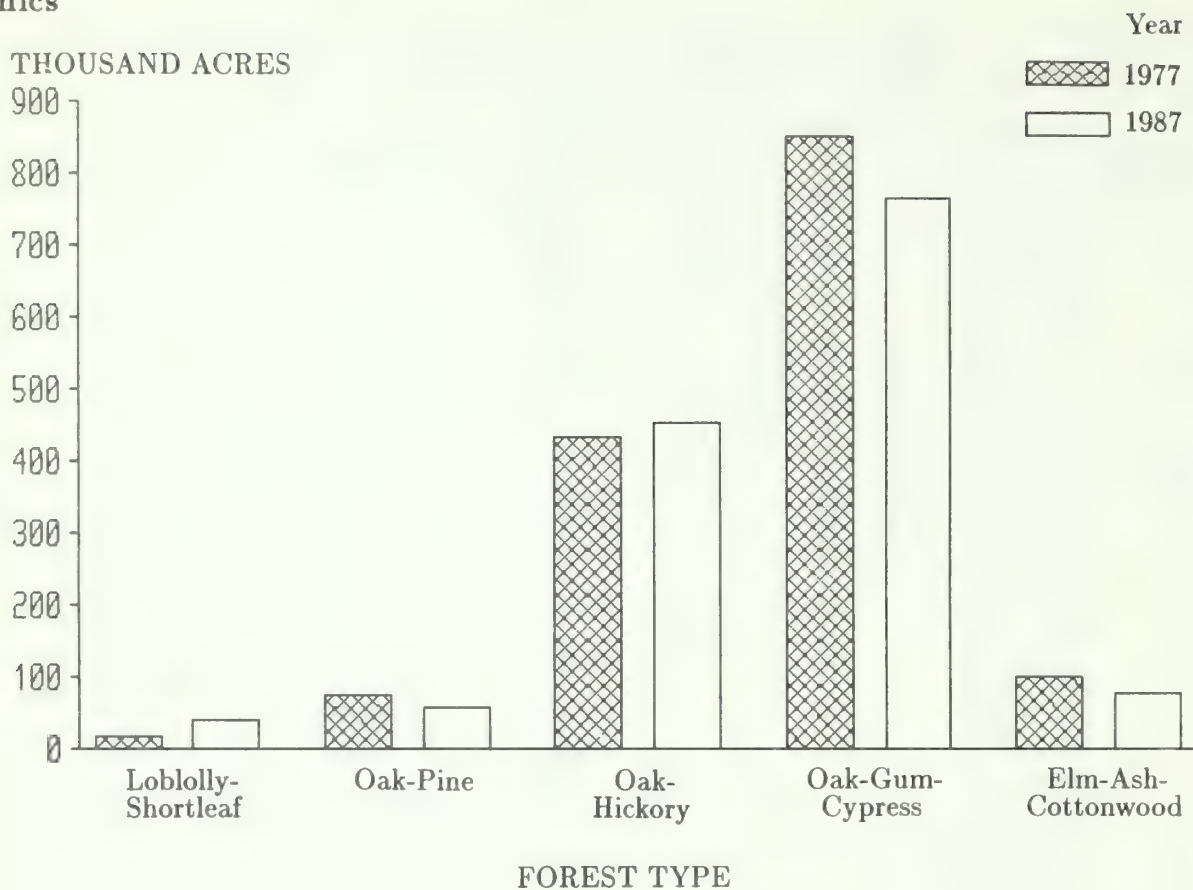


Figure 1.—Area of timberland by forest type, Mississippi, Delta Region, 1977 and 1987.

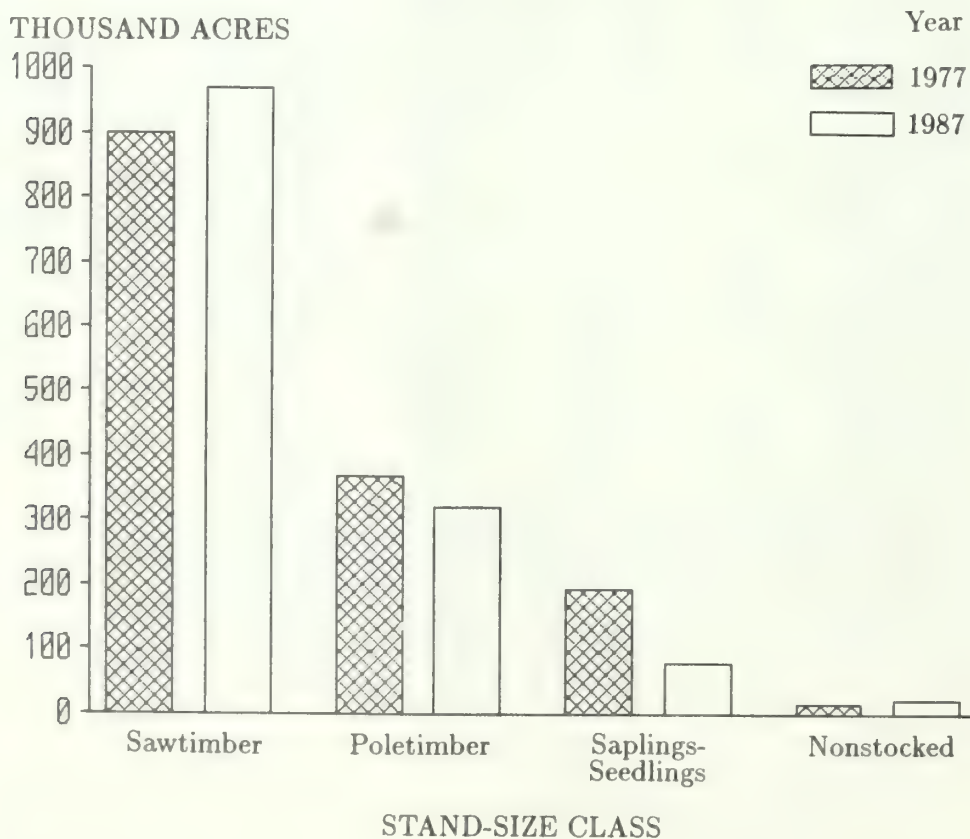


Figure 2.—Area of timberland by stand-size class, Mississippi, Delta Region, 1977 and 1987.

MILLION CUBIC FEET

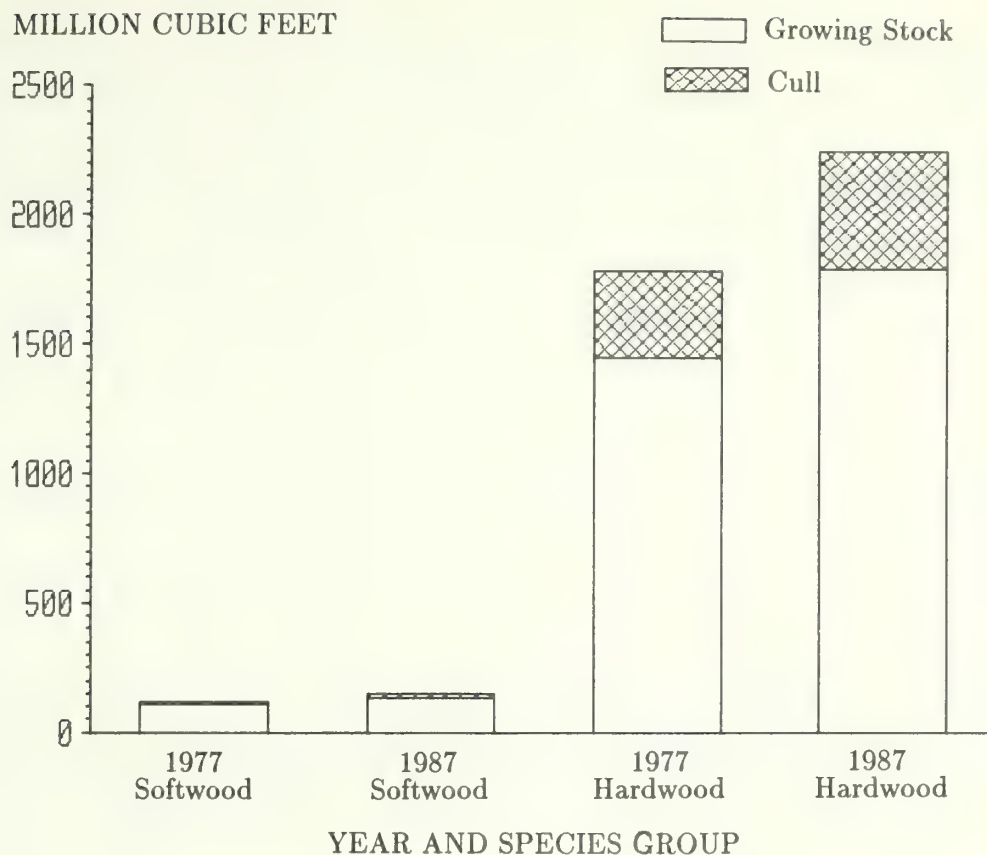


Figure 3.—Volume of timber on timberland by species group and class of timber, Mississippi, Delta Region, 1977 and 1987.

MILLION CUBIC FEET

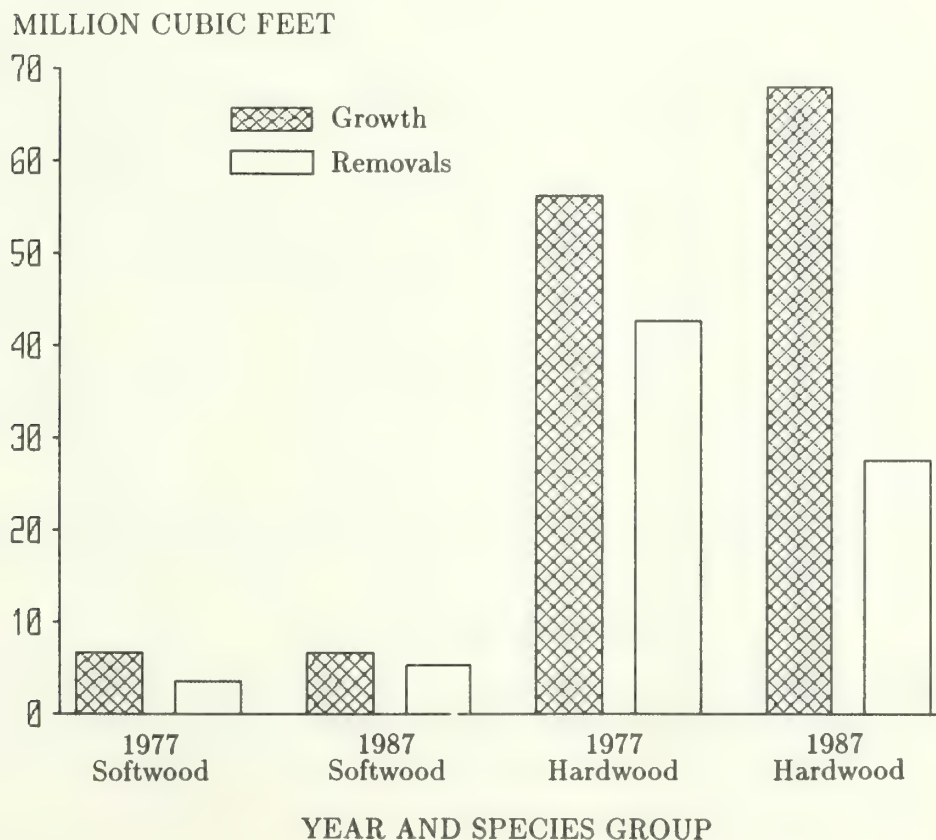


Figure 4.—Average net annual growth and average annual removals of growing stock on timberland by species group, Mississippi, Delta Region, 1977 and 1987.

MILLION CUBIC FEET

Year

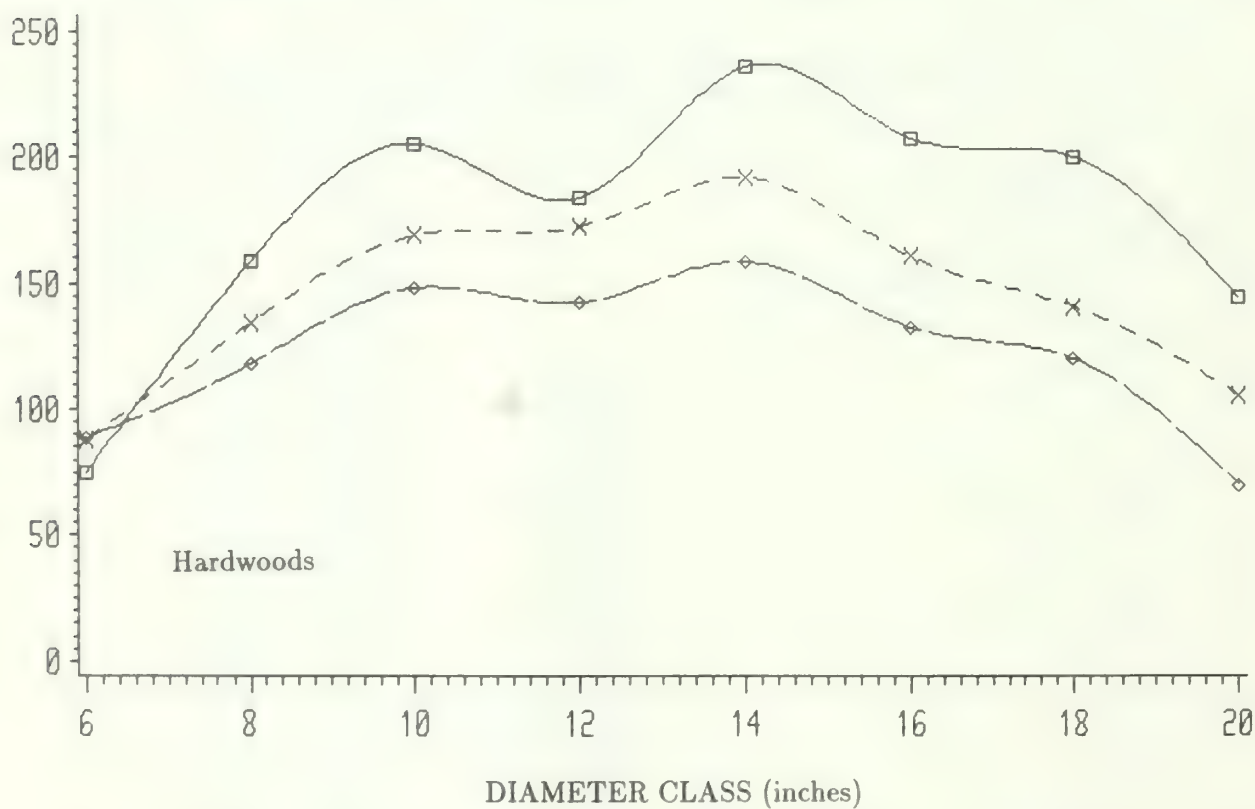
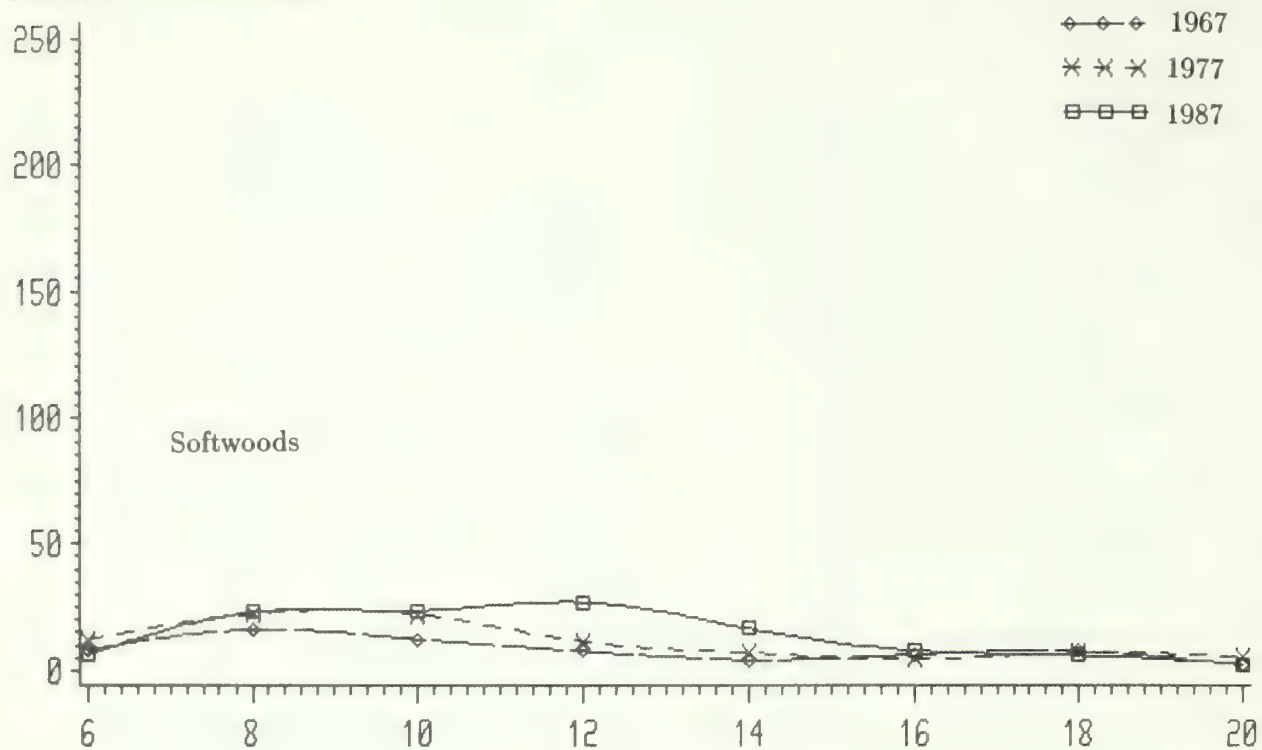


Figure 5.—Volume of softwood and hardwood growing stock on timberland by diameter class, Mississippi, Delta Region, 1967, 1977, and 1987.

MILLION TREES

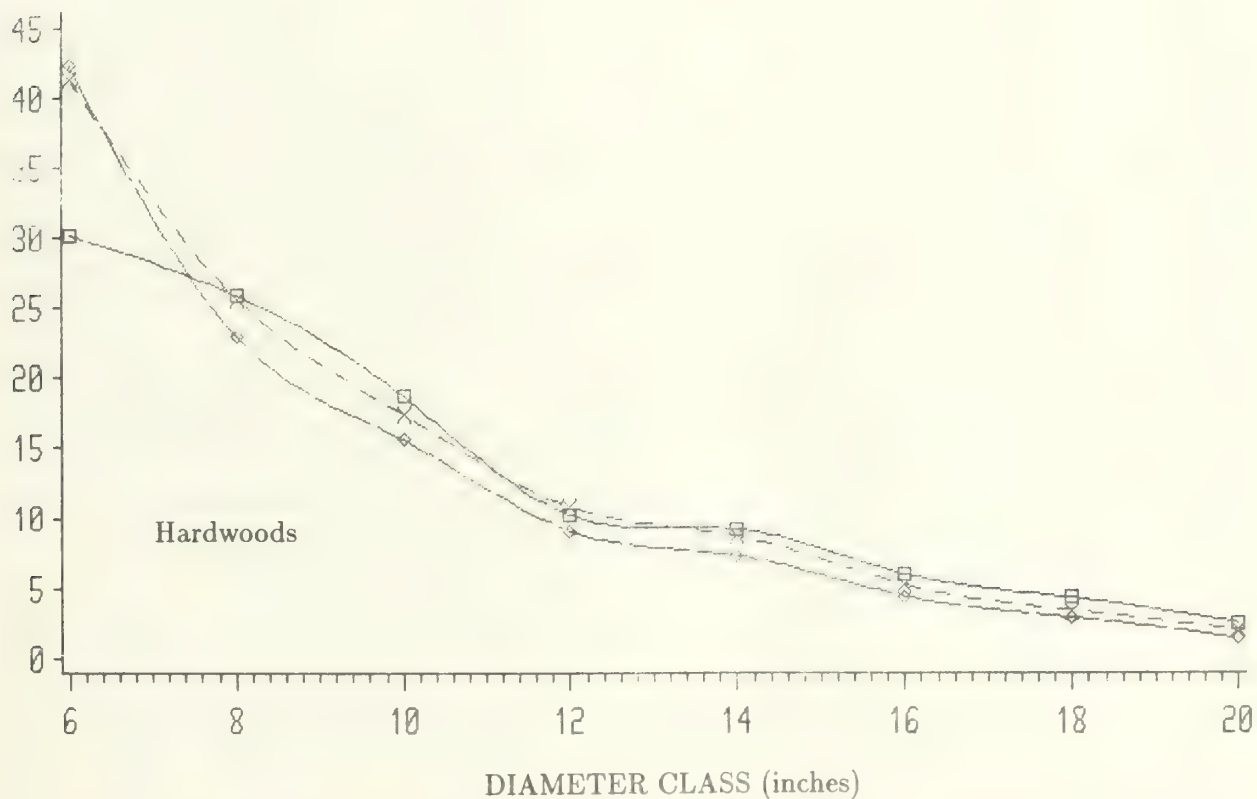
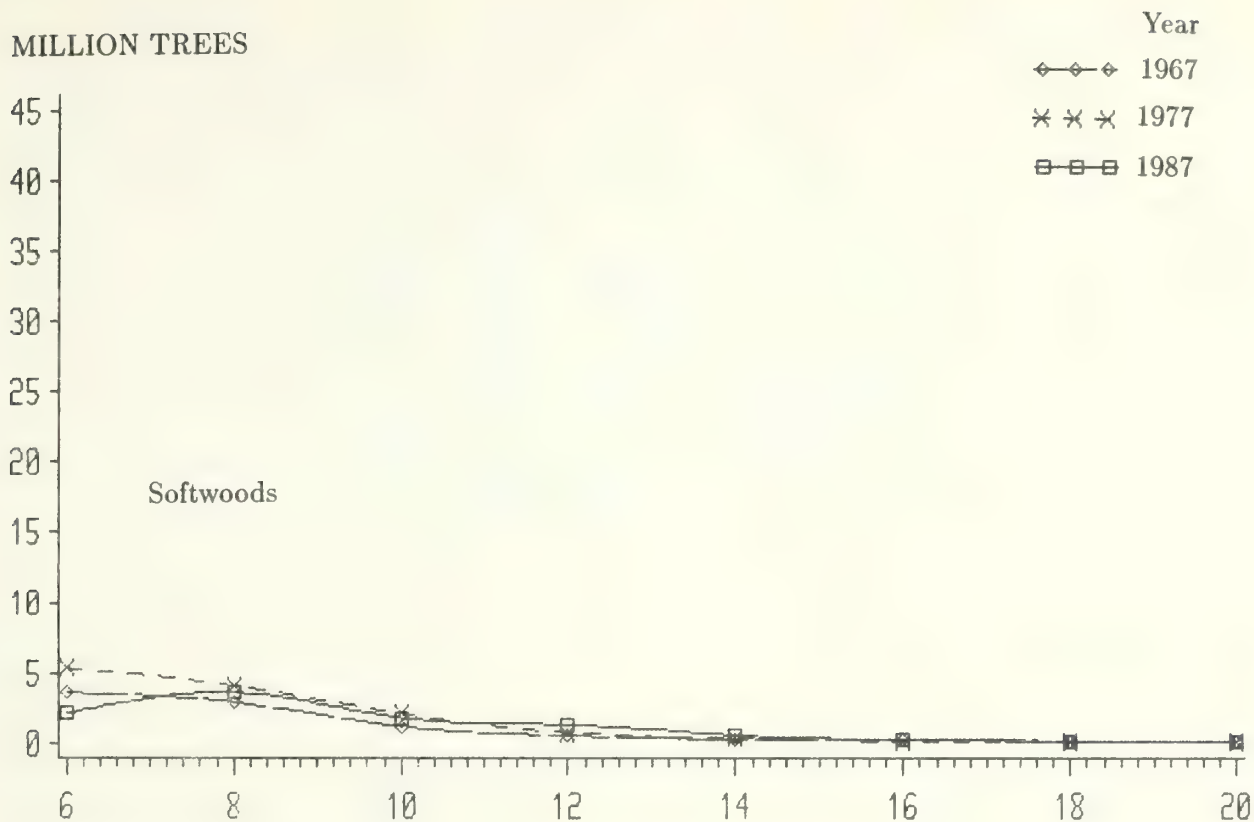


Figure 6.—Number of softwood and hardwood growing stock trees on timberland by diameter class, Mississippi, Delta Region, 1967, 1977, and 1987.

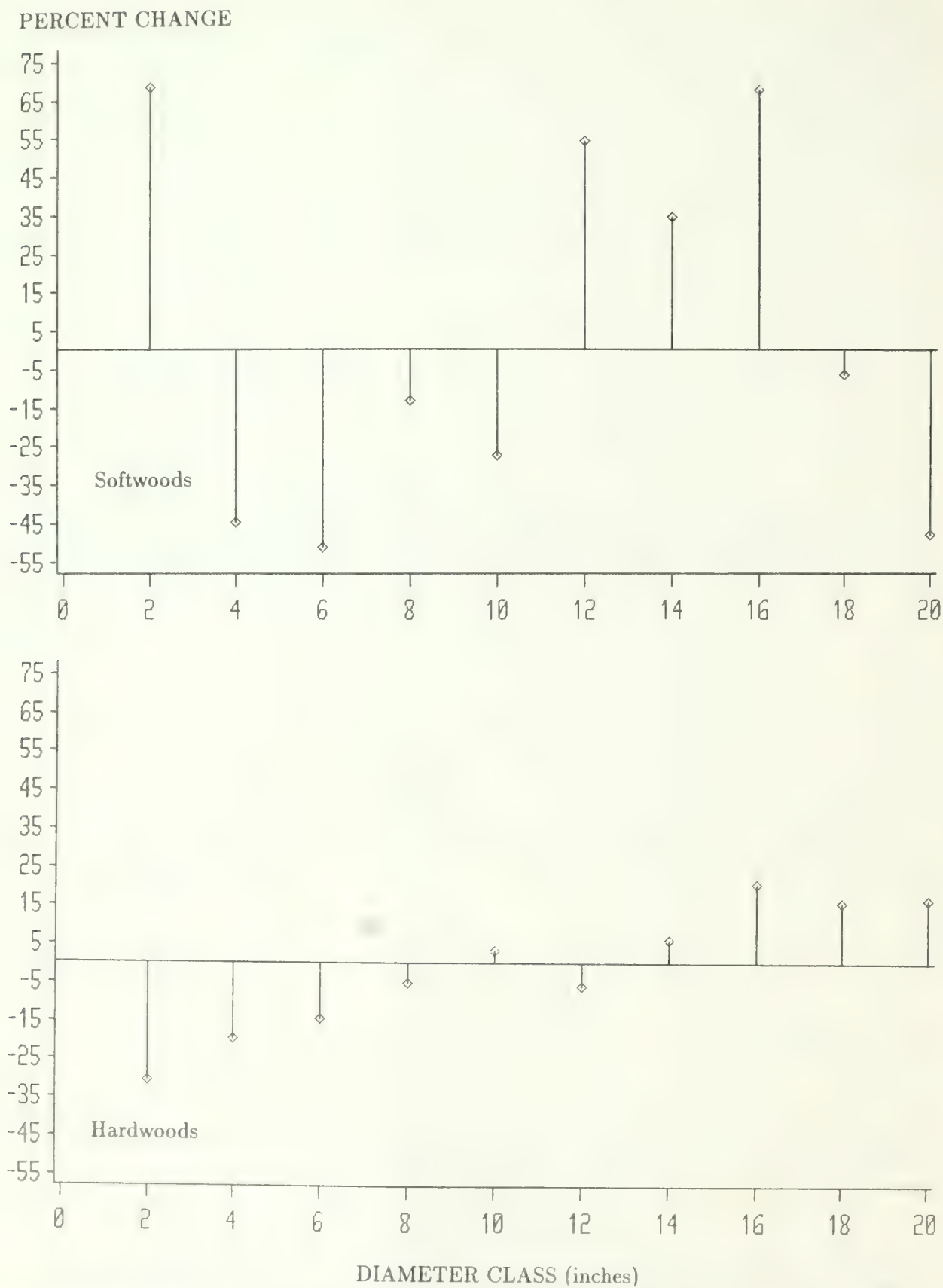


Figure 7.—Percent change in the number of live softwood and hardwood trees by diameter class, Mississippi, Delta Region, 1977 to 1987.

ACKNOWLEDGMENTS

The Southern Station gratefully acknowledges the cooperation and assistance provided by the Mississippi Forestry Commission and forest industries in collecting field data. Appreciation is also expressed for the cooperation of other public agencies and other private landowners in providing access to the sample locations.

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Tabulates forest resource information from a new inventory of Mississippi Delta counties.

Additional Keywords: Area, volume, forest type, stand size, ownership.

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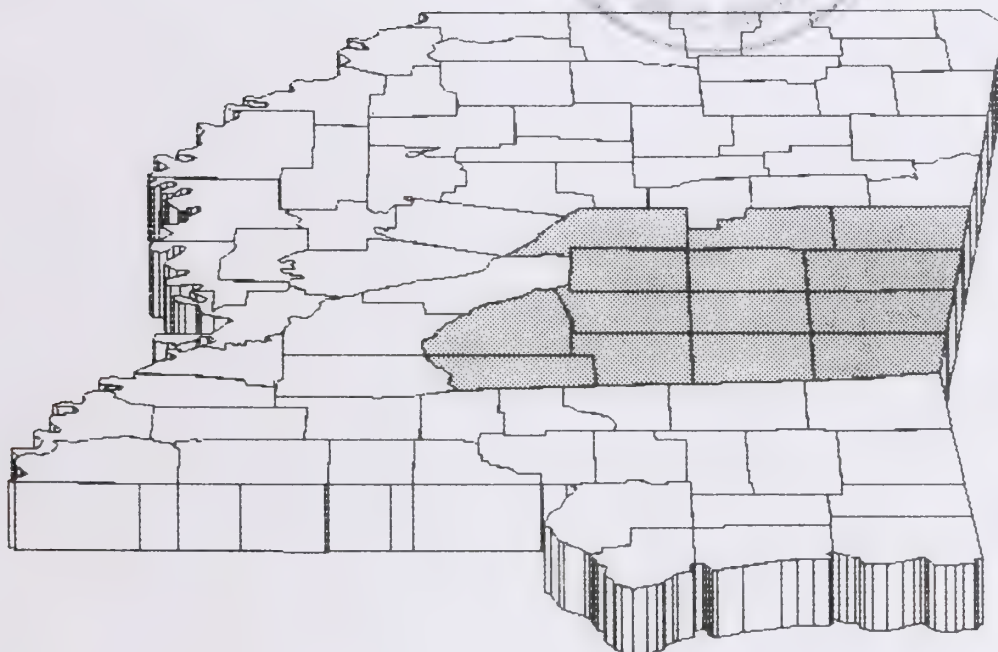
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Forest Statistics for Central Mississippi Counties - 1987

John F. Kelly and F. Dee Hines



SUMMARY

The 1987 survey of the 14 counties in the Central Mississippi unit indicated the following changes since the previous survey in 1977:

- * Timberland area, now covering 4,097.0 thousand acres, has increased 6 percent.
- * Forest industry-owned timberland increased 112.5 thousand acres, or 13 percent.
- * Pine forest types decreased by 11 percent.
- * Oak-pine and oak-hickory forest types increased by 12 and 41 percent respectively.
- * Sapling-seedling stands increased 29 percent; poletimber stands decreased 15 percent; sawtimber stands increased 4 percent.
- * Planted area increased 275.6 thousand acres, a 90 percent increase.
- * Softwood growing-stock volume decreased 2 percent; softwood sawtimber volume increased 12 percent.
- * Hardwood growing-stock volume increased 20 percent; hardwood sawtimber volume increased 29 percent.
- * Net growth of softwood growing stock decreased by 21 percent.
- * Net growth of hardwood growing stock increased by 22 percent.
- * Removals of growing stock increased 34 percent. Softwood removals increased 36 percent; softwood removals now exceed growth. Hardwood removals increased by 31 percent.
- * Mortality of growing stock increased 87 percent.

FOREWORD

The Southern Forest Survey, an activity of the Southern Forest Experiment Station Forest Inventory and Analysis work unit, covers the States of Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, Tennessee, and East Texas, and the island of Puerto Rico.

This survey is part of the nationwide Forest Survey originally authorized by the McSweeney-McNary Act of 1928. More recent legislation pertinent to the survey mission includes the Forest and Rangeland Renewable Resources Planning Act of 1974 and the Forest and Rangeland Renewable Resources Research Act of 1978. The survey mission is to develop, analyze, and maintain renewable forest resource information. This information is essential for formulation of forest policies and programs.

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*Core tables are presented in response to the Southern Industrial Forestry Research Council's recommendations. These tables are identical among Forest Inventory and Analysis units in the eastern United States.

ERRATA

P. 23, table 29 -- Eliminate "by timberland" in caption

P. 26 -- Change "Million cubic feet" to
"Thousand trees."

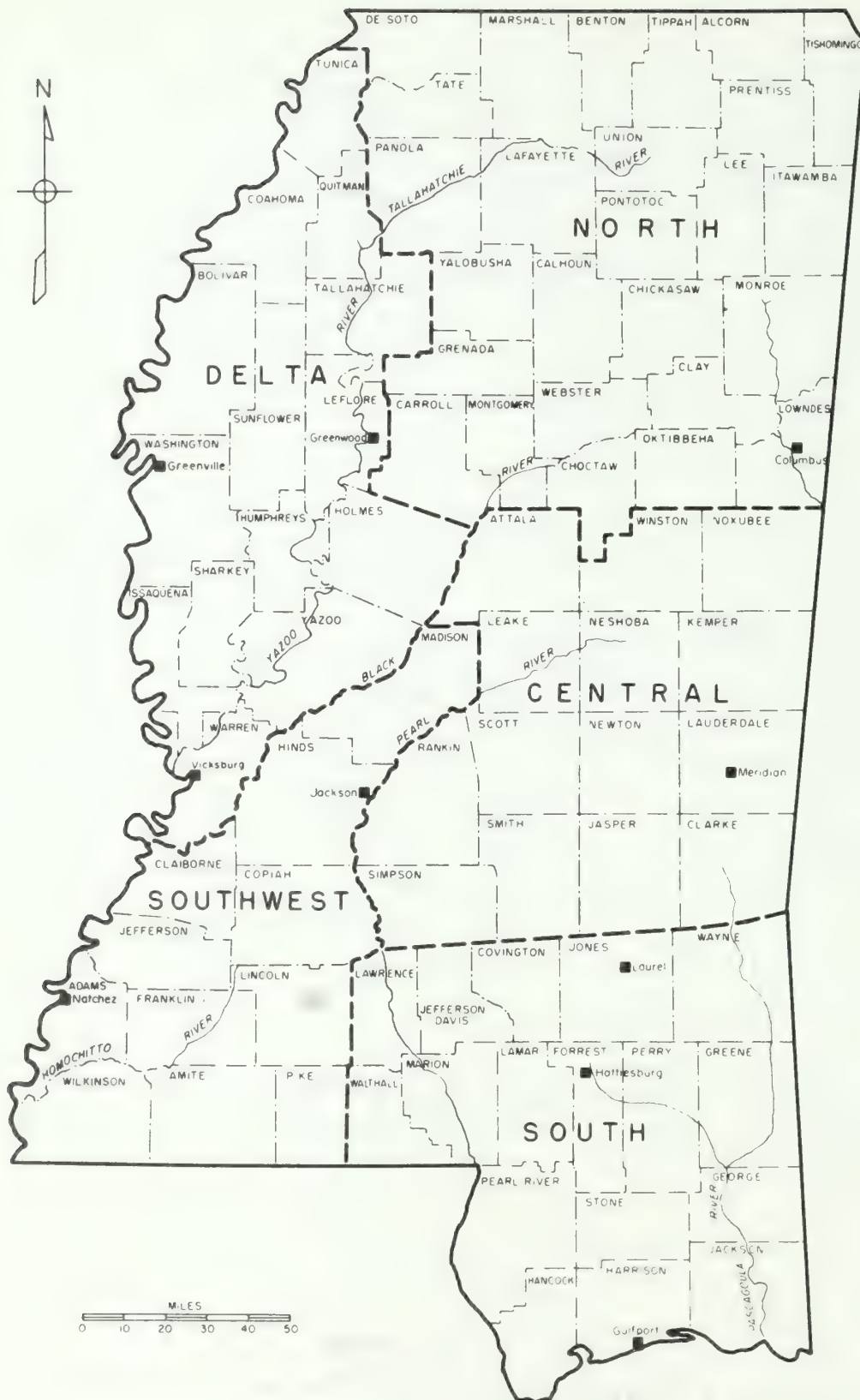


Figure I.—The forest survey regions of Mississippi

Forest Statistics for Central Mississippi Counties—1987

John F. Kelly and F. Dee Hines

INTRODUCTION

The tables in this report were derived from data obtained from an inventory of 14 counties comprising the Central Unit of Mississippi (Fig. 1). The data on forest acreage and timber volume were secured by a three-step process. A forest-nonforest classification was accomplished on aerial photographs for points representing approximately 230 acres. These photo classifications were adjusted on the basis of ground observations at sample locations representing approximately 3,840 acres. Finally, forest locations at the intersections of a grid of lines spaced 3 miles apart were subjected to on-the-ground measurements. At these forest locations, per-acre estimates were obtained from trees measured on ten 37.5 basal area factor prism points.

The sampling methods were designed to achieve suitable sampling errors for estimates

of area and volume at the State level. Sampling error increases as the area or volume considered decreases. The sampling errors presented in Table I, equal to one standard deviation for the sample data, may be used to construct confidence intervals for population parameters. For example, at the 95 percent confidence level, the confidence interval for growing-stock volume (in million cubic feet) in Central Mississippi (with a sampling error of 3.2 percent) is

$$4,984.6 \pm 1.96(0.032 \times 4,984.6) = 4,984.6 \pm 312.6$$

where 1.96 is the number of standard deviations. This confidence interval indicates that the actual growing-stock volume lies in the range 4,672.0 to 5,297.2 million cubic feet, unless a 1 in 20 chance of a random event has occurred.

Table I—Sampling errors¹ for timberland, growing stock, and sawtimber, Central Mississippi, 1987

County	Timberland	Growing stock			Sawtimber volume
		Volume	Growth	Removals	
----- <i>Percent</i> -----					
Attala	2.1	11.8	9.0	15.6	12.6
Clarke	1.8	12.8	12.2	12.7	15.1
Jasper	2.5	16.0	9.8	17.5	20.8
Kemper	2.0	11.0	10.3	16.4	12.8
Lauderdale	2.2	10.0	8.3	14.4	11.8
Leake	2.5	14.6	9.8	14.7	17.3
Neshoba	2.5	11.9	13.1	22.2	15.0
Newton	2.7	12.6	10.1	22.2	14.4
Noxubee	1.7	11.2	11.2	27.0	13.7
Rankin	1.9	9.9	14.5	22.7	12.5
Scott	2.5	9.7	8.3	19.4	12.2
Simpson	3.2	13.2	10.8	17.4	16.9
Smith	2.7	9.3	10.4	15.0	11.4
Winston	2.2	11.6	11.3	25.4	15.7
All counties	0.6	3.2	2.9	4.9	3.9

¹ By random-sampling formula.

Sampling errors for sub-groups of counties in the unit may be estimated by the following:

$$SE_g = \frac{SE_t \sqrt{X_t}}{\sqrt{X_g}}$$

where:

- SE = standard error of estimate
(expressed as a percent)
- X = variable of interest
(area or volume)
- g = group of counties to be combined
- t = total for the unit.

For comparative purposes, the 1977 survey data, collected from the last complete forest survey of Mississippi, was reprocessed according to current procedures. These procedures included the use of the same methods for estimating growth and removals. Thus, differences between the 1977 and 1987 data should reflect resource changes and not data processing differences. The results from the reprocessed 1977 survey data were used for comparison to the 1987 data in the Highlights that follow.

HIGHLIGHTS

Timberland Area

Total timberland in Mississippi's Central Unit has increased 217.7 thousand acres, from 3,879.3 thousand acres in 1977 to 4,097.0 thousand acres in 1987. With this 6 percent increase in timberland the unit is now 69 percent forested.

The ownership of timberland has increased by small amounts for forest industry and other public timberland. Forest industry lands, including those under long-term lease, increased 112.5 thousand acres, or 13 percent, since 1977. Other public lands increased to 77.1 thousand acres, a 20 percent increase. Other private timberland increased 3 percent to 2,838.0 thousand acres. All public timberland now accounts for 7 percent of the total; forest industry accounts for 24 per-

cent; other private timberland accounts for 69 percent.

Changes in forest types have occurred since the 1977 survey. Pine forest types have decreased 11 percent, but still account for the largest proportion of the resource at 32 percent of total timberland. The oak-pine forest type increased by 12 percent to 918.9 thousand acres. The largest change occurred in the oak-hickory type which increased 362.3 thousand acres, or 41 percent, to 1,241.6 thousand acres. The oak-gum-cypress forest type decreased by 78.4 thousand acres to 614.1 thousand acres.

Shifts are occurring in stand sizes in the Central Mississippi Unit, with the largest change being a 29 percent increase in sapling-seedling stands. The area of sapling-seedling stands increased 284.5 thousand acres since 1977 and now covers 1,253.1 thousand acres. Poletimber stands, on the other hand, decreased 159.3 thousand acres, or 15 percent. Sawtimber stands, while increasing only 4 percent, occupy the largest area at 1,891.9 thousand acres, or 46 percent of the total timberland area.

The large increase in planted stands since 1977 accounted for most of the increase in sapling-seedling stands. Planted stands increased 275.6 thousand acres, or 90 percent, to 582.3 thousand acres.

Number of Trees

The number of all live trees in Central Mississippi declined, principally due to fewer softwoods. While the total number of hardwood trees remained about the same as in 1977, softwood trees decreased by 19 percent. The decrease in the number of softwood trees was concentrated in diameter-at-breast-height (dbh) classes below 14 inches; the number of softwood trees increased in the 14 inch and larger dbh classes. While the number of hardwood trees also increased in the larger dbh classes, they also increased in many smaller classes; only the 4-inch and 12-inch dbh classes showed decreases.

The number of growing-stock trees decreased even more than all live trees, with decreases concentrated in the smaller dbh classes for both hardwoods and softwoods. The number of softwood growing-stock trees decreased by 21 percent, resulting from decreases in the 12-inch and smaller dbh classes; the number of softwood trees in larger classes increased. Hardwood growing-stock trees likewise decreased in number by 43 percent, resulting from decreases in the 6-inch and smaller dbh classes; again, all larger dbh classes showed an increase for hardwood growing-stock trees.

Timber Volume

Softwood growing-stock volume has decreased slightly in the survey period 1977-1987, in contrast to a large increase in the previous survey period. The 1987 survey shows a small decrease of 46.6 million cubic feet, or 2 percent, since 1977. The previous survey indicated an increase of 687.7 million cubic feet, or 32 percent from 1967 to 1977.

While 1987 softwood sawtimber volumes have increased since the 1977 survey, the increase is smaller than in the 1967-1977 period. From 1977 to 1987, softwood sawtimber volume increased 1,367.0 million board feet, or 12 percent. This contrasts with an increase of 3,790.0 million board feet, or 49 percent from 1967 to 1977.

Hardwood volumes have increased since 1977, with the increase somewhat larger than that indicated for the period 1967-1977. Since 1977 hardwood growing stock has increased 368.2 million cubic feet, or 20 percent; hardwood sawtimber increased 1,455.8 million board feet, or 29 percent. From 1967 to 1977, hardwood growing stock increased 15 percent, and hardwood sawtimber increased 15 percent.

The volume of cull trees has increased since 1977, with softwoods showing a larger relative increase. Softwood cull tree volume increased 45 percent to 102.9 million cubic feet. Hardwood cull tree volume increased

19 percent to 473.8 million cubic feet. Hardwoods still account for most of cull tree volume at 82 percent of the total.

Growth, Removals, and Mortality

Total net annual growth has decreased by 9 percent since the 1977 survey, and is due to the decrease in softwood growth; hardwood growth increased. Growth is calculated as an annual average for the inter-survey period, i.e., 1977-1987; removals and mortality are similarly calculated. Virtually all of the decrease in net growth from the previous period (1967-1977) is attributable to softwoods which decreased 21 percent from 194.5 million cubic feet annually in the previous period to 153.4 million cubic feet annually for the current period. Hardwood growth, however, showed an increase from 79.2 million cubic feet annually for the 1967-1977 period to 96.8 million cubic feet annually for the 1977-1987 period, a change of 22 percent.

Growing-stock removals have increased since the 1977 survey for both softwoods and hardwoods. Softwood removals increased 36 percent, from 129.1 million cubic feet in the 1977 survey to 175.3 million cubic feet in the current survey. The current survey indicates that softwood removals now exceed softwood growth by 14 percent; this trend could have serious implications for future industrial expansion. Hardwood removals likewise increased by 31 percent, from 51.2 million cubic feet to 66.9 million cubic feet annually; hardwood growth exceeds removals, however.

Mortality has increased by 87 percent since the 1977 survey, with softwood mortality more than double the previous estimate. The 1987 survey indicates softwood mortality at 25.8 million cubic feet annually, an increase from 10.5 million cubic feet in 1977. Hardwood mortality, now at 15.3 million cubic feet annually, is up 33 percent from the 1977 estimate of 11.5 million cubic feet.

Tables 1-25 were developed to provide compatibility among Forest Inventory and Analysis Projects. Tables 26-36 are supple-

mentary tables and may change from unit to unit or state to state to address specific resource issues.

DEFINITION OF TERMS

Average net annual growth.—Average net annual volume increase for the inter-survey period.

Average annual mortality.—Average annual sound-wood volume of growing-stock trees dying from natural causes.

Average annual removals.—Average net annual volume of growing-stock trees removed from the inventory by harvesting, cultural operations (such as timber-stand improvement), land clearing, or changes in land use.

Forest type.—A classification of forest land based upon the species forming a plurality of live-tree stocking.

Growing-stock trees.—Live trees of commercial species. Rough and rotten trees are excluded.

Growing-stock volume.—The cubic-foot volume of sound wood in growing-stock trees at least 5.0 inches in diameter at breast height, from a 1-foot stump to a minimum 4.0-inch top diameter outside bark of the central stem, or to the point where the central stem breaks into limbs.

Noncommercial species.—Tree species of typically small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products.

Poletimber trees.—Growing-stock trees of commercial species at least 5.0 inches in diameter at breast height, but smaller than sawtimber size.

Rotten trees.—Live trees of commercial species that do not contain at least one 12-foot saw log, now or prospectively, primarily because of rot.

Reserved timberland.—Productive public forest land withdrawn from timber utilization through statute or administrative regulations.

Rough trees.—Live trees of commercial species that do not contain at least one 12-foot saw log, now or prospectively, primarily because of roughness or poor form. Also included are all live trees of noncommercial species.

Sawtimber trees.—Live trees that are of commercial species, contain at least a 12-foot saw log, and meet regional specifications for freedom from defect. Softwoods must be at least 9.0 inches in diameter at breast height and hardwoods at least 11.0 inches in diameter at breast height.

Sawtimber volume.—Sound-wood volume of the saw-log portion of live sawtimber trees in board feet, International 1/4-inch rule and in cubic feet.

Site class.—A classification of forest land in terms of inherent capacity to grow crops of industrial wood.

Stand-size class.—A classification of forest land based on the size class of growing-stock trees on the sampled area; that is, sawtimber, poletimber, or sapling and seedling.

Timberland.—Forest land that is producing, or is capable of producing, crops of industrial wood and not withdrawn from timber utilization. Timberland is synonymous with "commercial forest land" in prior reports.

Tree grade.—A classification of the volume of the saw-log portion of sawtimber trees, based on the log grade of the butt log.

Woodland.—Forest land incapable of yielding crops of industrial wood because of adverse site conditions.

Core Tables 1-25

Table 1—Area by county and land class, Central Mississippi, 1987

County	All land ¹	Forest land			Reserved timberland	Nonforest land
		Total	Timberland ²	Woodland ³		
----- Thousand acres -----						
Attala	471.5	355.8	355.8	...	...	115.7
Clarke	443.0	356.4	356.4	...	...	86.6
Jasper	433.8	353.4	353.4	...	...	80.4
Kemper	490.5	361.3	361.3	...	...	129.2
Lauderdale	451.0	347.3	347.3	...	...	103.7
Leake	373.9	257.2	257.2	...	...	116.7
Neshoba	365.8	236.3	236.3	...	...	129.5
Newton	371.1	251.1	251.1	...	...	120.0
Noxubee	446.6	212.7	212.7	...	...	233.9
Rankin	500.5	306.7	306.7	...	...	193.8
Scott	390.3	258.4	258.4	...	...	132.0
Simpson	378.0	240.2	240.2	...	...	137.8
Smith	406.5	284.8	284.8	...	...	121.7
Winston	390.2	275.5	275.5	...	...	114.8
All counties	5912.7	4097.0	4097.0	...	...	1815.7

¹ From U.S. Bureau of the Census.

² Forest land (formerly termed commercial forest land) that is producing or capable of producing at least 20 cubic feet of industrial wood per acre per year. Includes areas which may be inaccessible or inoperable by current standards. Excludes reserved timberlands.

³ Forest land incapable of producing 20 cubic feet of industrial wood per acre per year under natural conditions because of adverse site conditions.

Table 2—Area of timberland by county and ownership class, Central Mississippi, 1987

County	All ownerships	National forest	Misc. federal	State	County and municipal	Forest industry ¹	Farmer	Corporate ²	Individual ²
----- Thousand acres -----									
Attala	355.8	...	5.8	...	...	87.5	70.0	5.8	186.7
Clarke	356.4	...	...	6.3	...	125.1	137.6	12.5	75.0
Jasper	353.4	17.7	...	...	...	94.2	82.5	...	159.0
Kemper	361.3	...	5.6	...	...	116.7	72.3	...	166.7
Lauderdale	347.3	...	5.8	...	11.6	75.2	34.7	5.8	214.1
Leake	257.2	...	...	...	...	92.6	82.3	10.3	72.0
Neshoba	236.3	...	...	...	...	34.5	49.2	9.8	142.8
Newton	251.1	5.5	...	...	...	43.7	114.6	...	87.3
Noxubee	212.7	...	11.5	...	...	63.2	40.2	11.5	86.2
Rankin	306.7	...	...	...	12.3	36.8	73.6	30.7	153.3
Scott	258.4	80.0	...	...	...	36.9	30.8	...	110.7
Simpson	240.2	...	...	...	...	60.1	46.7	6.7	126.8
Smith	284.8	76.7	...	...	...	43.8	16.4	...	147.9
Winston	275.5	24.5	18.4	...	...	67.3	30.6	...	134.7
All counties	4097.0	204.3	47.0	6.3	23.8	977.6	881.5	93.1	1863.4

¹ Includes land leased to forest industry.

² Indian land will be classed as corporate or individual as defined by the Bureau of Indian Affairs.

Table 3—Area of timberland by county and forest type group, Central Mississippi, 1987

County	Total	Forest type group						
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress
		Planted	Natural	Planted	Natural			
----- Thousand acres -----								
Attala	355.8	...	...	23.3	64.2	81.7	140.0	46.7
Clarke	356.4	...	...	56.3	68.8	68.8	131.3	31.3
Jasper	353.4	...	...	17.7	70.7	76.6	135.5	53.0
Kemper	361.3	...	...	83.4	100.0	83.4	38.9	55.6
Lauderdale	347.3	...	...	28.9	115.8	52.1	104.2	46.3
Leake	257.2	...	...	36.0	51.4	46.3	92.6	30.9
Neshoba	236.3	...	...	4.9	39.4	64.0	73.8	54.1
Newton	251.1	5.5	...	16.4	54.6	65.5	49.1	60.0
Noxubee	212.7	...	...	23.0	63.2	40.2	34.5	51.7
Rankin	306.7	...	...	6.1	61.3	85.9	98.1	55.2
Scott	258.4	...	...	...	80.0	43.1	110.7	24.6
Simpson	240.2	...	...	13.3	66.7	60.1	53.4	46.7
Smith	284.8	...	5.5	11.0	87.6	65.7	87.6	27.4
Winston	275.5	...	6.1	18.4	42.8	85.7	91.8	30.6
All counties	4097.0	5.5	11.6	338.7	966.6	918.9	1241.6	614.1

**Table 4—Area of timberland by county and stand-size class,
Central Mississippi, 1987**

County	All classes	Stand-size class			Nonstocked ¹ areas
		Sawtimber	Poletimber	Sapling- seedling	
-----Thousand acres-----					
Attala	355.8	110.8	105.0	134.2	5.8
Clarke	356.4	112.6	106.3	131.3	6.3
Jasper	353.4	100.1	76.6	170.8	5.9
Kemper	361.3	139.0	94.5	127.8	...
Lauderdale	347.3	219.9	40.5	86.8	...
Leake	257.2	97.7	51.4	102.9	5.1
Neshoba	236.3	118.1	44.3	73.8	...
Newton	251.1	125.6	43.7	76.4	5.5
Noxubee	212.7	132.2	28.7	51.7	...
Rankin	306.7	208.5	55.2	42.9	...
Scott	258.4	153.8	67.7	36.9	...
Simpson	240.2	86.8	80.1	73.4	...
Smith	284.8	164.3	38.3	76.7	5.5
Winston	275.5	122.4	85.7	67.3	...
All counties	4097.0	1891.9	918.0	1253.1	34.1

¹ Timberland less than 16.7 percent stocked.

**Table 5—Area of timberland by county and site class,
Central Mississippi, 1987**

County	All classes	Site class (cubic feet/acre/year)				
		>165	120-165	85-120	50-85	<50
-----Thousand acres-----						
Attala	355.8	23.3	93.3	175.0	64.2	...
Clarke	356.4	37.5	68.8	137.6	100.0	12.5
Jasper	353.4	53.0	111.9	111.9	76.6	...
Kemper	361.3	50.0	66.7	150.1	94.5	...
Lauderdale	347.3	52.1	138.9	92.6	57.9	5.8
Leake	257.2	56.6	77.2	102.9	20.6	...
Neshoba	236.3	34.5	73.8	123.1	4.9	...
Newton	251.1	27.3	92.8	103.7	21.8	5.5
Noxubee	212.7	34.5	63.2	69.0	46.0	...
Rankin	306.7	30.7	85.9	177.9	12.3	...
Scott	258.4	49.2	123.0	49.2	30.8	6.2
Simpson	240.2	20.0	46.7	153.5	20.0	...
Smith	284.8	5.5	76.7	175.3	27.4	...
Winston	275.5	30.6	61.2	128.5	55.1	...
All counties	4097.0	504.8	1180.2	1750.2	632.0	29.9

Table 6—Area of timberland by county and stocking classes of growing-stock trees, Central Mississippi, 1987

County	All classes	Stocking class (percent)				
		>130	100-130	60-100	16.7-60	<16.7
----- <i>Thousand acres</i> -----						
Attala	355.8	5.8	105.0	221.6	17.5	5.8
Clarke	356.4	12.5	50.0	200.1	87.5	6.3
Jasper	353.4	29.5	70.7	176.7	70.7	5.9
Kemper	361.3	...	100.0	216.8	44.5	...
Lauderdale	347.3	11.6	127.3	191.0	17.4	...
Leake	257.2	20.6	41.2	133.8	56.6	5.1
Neshoba	236.3	4.9	39.4	157.5	34.5	...
Newton	251.1	10.9	38.2	169.2	27.3	5.5
Noxubee	212.7	...	51.7	138.0	23.0	...
Rankin	306.7	18.4	98.1	147.2	42.9	...
Scott	258.4	24.6	30.8	147.6	55.4	...
Simpson	240.2	...	66.7	113.4	60.1	...
Smith	284.8	16.4	49.3	180.8	32.9	5.5
Winston	275.5	12.2	61.2	165.3	36.7	...
All counties	4097.0	167.5	929.7	2359.0	606.8	34.1

Table 7—Area of timberland by forest type and ownership class, Central Mississippi, 1987

Forest type ¹	All ownerships	National forest	Other public	Forest industry	Forest industry- leased	Other private
----- Thousand acres -----						
Longleaf-slash pine	17.1	...	...	11.6	...	5.5
Loblolly-shortleaf pine	1305.3	81.1	36.2	358.0	32.5	797.4
Softwood total	1322.4	81.1	36.2	369.6	32.5	802.9
Oak-pine	918.9	51.9	17.6	210.5	11.9	626.9
Oak-hickory	1241.6	53.7	5.8	177.7	20.6	983.9
Oak-gum-cypress	614.1	17.5	17.5	132.3	22.6	424.3
Hardwood total	2774.7	123.1	40.9	520.5	55.1	2035.1
All types	4097.0	204.3	77.1	890.1	87.6	2838.0

¹ Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

Table 8—Area of timberland by ownership and stocking classes of growing-stock trees, Central Mississippi, 1987

Ownership class	All classes	Stocking class (percent)				
		>130	100-130	60-100	16.7-60	<16.7
----- <i>Thousand acres</i> -----						
National forest	204.3	28.9	28.0	135.0	12.3	...
Other public	77.1	6.1	30.1	35.1	5.8	...
Forest industry	890.1	35.7	235.0	485.1	123.3	10.9
Forest industry-leased	87.6	5.1	22.2	55.1	5.1	...
Other private	2838.0	91.6	614.3	1648.7	460.3	23.1
All ownerships	4097.0	167.5	929.7	2359.0	606.8	34.1

Table 9—Area of timberland by forest type and stand-size class, Central Mississippi, 1987

Forest type ¹	All classes	Stand-size class			Nonstocked ² areas
		Sawtimber	Poletimber	Sapling- seedling	
----- <i>Thousand acres</i> -----					
Longleaf-slash pine	17.1	17.1	...	...	...
Loblolly-shortleaf pine	1305.3	747.6	245.0	312.7	...
Softwood total	1322.4	764.6	245.0	312.7	...
Oak-pine	918.9	437.2	222.9	258.9	...
Oak-hickory	1241.6	343.7	301.4	573.7	22.7
Oak-gum-cypress	614.1	346.3	148.7	107.7	11.3
Hardwood total	2774.7	1127.3	673.0	940.4	34.1
All types	4097.0	1891.9	918.0	1253.1	34.1

¹ Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

² Timberland less than 16.7 percent stocked.

Table 10—Number of live trees on timberland by species and diameter class, Central Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----													
Longleaf-slash pines	4996	500	527	460	1023	702	918	471	276	98	20	...	...
Shortleaf-loblolly pine	545963	216342	123369	73690	49544	31198	21523	14578	8432	3827	1836	1571	53
Other yellow pines	7333	2190	540	1228	889	555	464	511	331	199	221	197	9
Cypress	302	...	...	110	...	35	29	40	46	13	10	18	...
Other softwoods	18377	12980	2449	1697	453	582	110	41	66	...	...	...	...
Total softwoods	576971	232013	126885	77185	51908	33072	23043	15642	9152	4136	2087	1787	62
Select white oaks	84464	46317	16080	7398	5096	3046	2213	1578	1174	593	398	527	44
Select red oaks	27549	11137	6452	3062	2135	1858	975	583	554	284	208	261	40
Other white oaks	72186	38270	12443	8010	5457	3314	1951	1340	738	315	182	149	15
Other red oaks	303543	202983	38198	22056	12484	9437	6658	4615	2615	1761	1127	1351	256
Hickory	142288	108886	15125	7381	3539	2711	1951	1228	694	408	227	138	...
Hard maple	577	...	562	...	...	...	...	...	15	...	...	...	...
Soft maple	201418	152798	31231	11460	3213	1588	811	202	46	37	18	15	...
Beech	5359	3289	531	424	81	74	149	166	185	182	77	174	28
Sweetgum	502201	328950	98525	39508	18861	8768	3751	2228	885	368	232	112	13
Tupelo-blackgum	159576	125271	17594	7155	4174	2706	1196	700	437	182	100	60	...
Ash	51492	37666	9696	1948	935	594	325	201	49	54	11	14	...
Cottonwood-aspen	214	...	...	...	172	...	32	...	...	...	10	...	...
Basswood	583	510	...	...	51	...	...	22	...	...	...	...	...
Yellow-poplar	53862	41383	4271	3246	1566	1082	691	642	358	216	201	180	27
Black walnut	61	...	...	...	...	...	49	...	...	12	...	...	...
Other hardwoods	405060	318731	57224	15741	7088	3114	1286	918	431	308	89	117	12
Total hardwoods	2010435	1416193	307932	127389	64853	38293	22039	14424	8182	4720	2879	3097	436
Noncommercial	221236	183168	20347	12404	3398	1250	348	120	131	60	10	...	...
All species	2808642	1831373	455164	216978	120159	72615	45431	30186	17464	8915	4976	4884	498

Table 11—Number of growing-stock trees on timberland by species and diameter class, Central Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----													
Longleaf-slash pines	4407	...	527	460	1023	665	890	448	276	98	20	...	...
Shortleaf-loblolly pine	456327	163971	101823	64406	46652	29584	20696	14069	8199	3660	1748	1474	45
Other yellow pines	5994	1114	540	1228	761	515	464	468	293	199	212	191	9
Cypress	302	...	...	110	...	35	29	40	46	13	10	18	...
Other softwoods	11168	6085	2449	1620	396	461	84	41	32	...	...	...	...
Total softwoods	478198	171171	105339	67825	48830	31259	22163	15067	8847	3968	1991	1684	54
Select white oaks	51668	20386	11931	6408	4630	2802	2009	1285	1021	542	317	326	11
Select red oaks	16744	3678	4318	2586	1929	1529	924	566	523	284	198	189	20
Other white oaks	28738	6296	5543	5972	4442	2806	1504	1199	536	204	162	70	3
Other red oaks	145407	70391	21592	18777	10921	8506	5619	4044	2248	1433	912	877	87
Hickory	50830	29166	6441	5823	3184	2291	1734	1010	619	308	186	69	...
Hard maple	577	...	562	...	...	...	...	...	15	...	...	...	...
Soft maple	48388	29452	9720	5779	1874	978	464	79	18	14	9	...	...
Beech	2534	1659	...	289	81	42	100	111	66	109	9	61	7
Sweetgum	234156	125384	47716	30664	16364	7792	3089	1974	669	300	162	38	4
Tupelo-blackgum	35831	17550	7254	3752	3173	2103	858	579	364	129	60	8	...
Ash	16263	9406	3725	1441	759	473	244	143	33	40	...	...	...
Cottonwood-aspen	214	...	...	...	172	...	32	...	...	...	10	...	...
Basswood	583	510	...	...	51	...	...	22	...	...	...	...	...
Yellow-poplar	36780	27247	2728	2557	1379	911	628	517	304	216	128	149	15
Black walnut	12	...	...	...	...	...	...	...	...	12	...	...	...
Other hardwoods	87663	48536	22501	8710	3812	2315	678	547	251	204	68	34	8
Total hardwoods	756387	389660	144030	92758	52771	32549	17885	12077	6667	3796	2221	1820	155
All species	1234585	560831	249369	160582	101601	63808	40048	27144	15514	7765	4211	3504	209

Table 12—Volume of growing stock on timberland by species and diameter class, Central Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)									
		5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Million cubic feet-----											
Longleaf-slash pines	70.9	1.2	8.4	9.6	19.8	14.2	11.0	5.4	1.2	...	...
Shortleaf-loblolly pine	2583.6	160.6	297.3	402.4	439.0	439.4	347.5	211.5	125.8	151.4	8.8
Other yellow pines	106.3	3.8	4.6	5.5	9.7	17.1	12.6	12.4	17.0	22.0	1.6
Cypress	8.6	0.3	...	0.8	0.6	1.6	2.2	0.7	0.6	1.9	...
Other softwoods	13.2	3.8	2.2	4.2	1.3	0.8	0.8	...	...	...	...
Total softwoods	2782.6	169.7	312.4	422.6	470.4	473.1	374.1	230.0	144.6	175.3	10.4
Select white oaks	244.7	16.9	27.6	30.7	35.1	32.7	34.7	23.4	18.5	23.4	1.6
Select red oaks	132.2	7.1	11.8	16.8	16.7	15.6	18.0	14.7	11.0	17.3	3.1
Other white oaks	152.0	14.3	24.1	28.1	22.4	26.4	15.5	8.1	7.2	5.5	0.5
Other red oaks	679.4	48.3	63.3	93.1	98.1	99.4	78.8	65.7	50.7	68.9	13.0
Hickory	168.7	13.1	17.7	26.3	31.0	26.8	22.3	14.8	11.2	5.6	...
Hard maple	0.4	...	...	...	...	...	0.4	...	...	...	...
Soft maple	46.5	14.7	10.7	10.7	7.3	1.6	0.4	0.4	0.7	...	...
Beech	19.6	1.0	0.4	0.4	1.8	2.4	2.1	4.6	0.4	4.0	1.7
Sweetgum	415.0	67.2	95.5	84.9	58.9	54.1	25.1	15.8	10.2	2.9	0.4
Tupelo-blackgum	97.1	9.1	16.1	23.0	14.5	14.1	11.3	5.4	3.4	0.3	...
Ash	24.0	3.7	4.3	5.7	4.1	3.5	0.9	1.8	...	...	...
Cottonwood-aspen	2.7	...	1.6	...	0.7	...	...	...	0.4	...	...
Basswood	0.9	...	0.4	...	...	0.5	...	...	...	...	...
Yellow-poplar	100.8	7.5	9.4	11.0	12.5	15.3	11.3	10.7	7.9	13.3	2.0
Black walnut	0.5	...	...	...	...	...	...	0.5	...	...	...
Other hardwoods	117.5	19.6	21.5	25.2	11.8	13.8	8.6	8.7	4.0	3.5	0.9
Total hardwoods	2202.0	222.3	304.2	355.8	315.0	306.3	229.5	174.6	125.6	145.6	23.2
All species	4984.6	392.0	616.7	778.4	785.4	779.3	603.6	404.6	270.2	320.9	33.6

Table 13—*Volume of growing stock in the saw-log portion of sawtimber¹ trees on timberland by species and diameter class, Central Mississippi, 1987*

Species	All classes	Diameter class (inches at breast height)							
		9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Million cubic feet-----									
Longleaf-slash pines	55.1	7.7	17.8	13.0	10.2	5.2	1.2	...	...
Shortleaf-loblolly pine	1906.8	326.9	393.8	404.8	321.5	196.5	116.7	138.8	7.7
Other yellow pines	89.3	4.3	8.4	15.7	11.4	11.4	16.0	20.7	1.4
Cypress	7.6	0.7	0.6	1.4	2.1	0.6	0.5	1.7	...
Other softwoods	5.7	3.2	1.0	0.8	0.7	...	...	...	...
Total softwoods	2064.5	342.9	421.6	435.7	346.0	213.7	134.4	161.1	9.2
Select white oaks	140.1	...	26.3	27.1	29.2	19.8	15.6	20.4	1.6
Select red oaks	80.6	...	11.3	13.2	15.8	12.4	10.1	15.3	2.5
Other white oaks	72.4	...	17.9	22.9	13.3	6.8	6.2	4.8	0.4
Other red oaks	393.7	...	70.8	83.0	68.5	56.5	42.9	60.1	11.7
Hickory	90.6	...	22.9	22.2	18.3	12.7	9.6	4.9	...
Hard maple	0.4	...	...	...	0.4	...	...	...	...
Soft maple	7.7	...	5.3	1.2	0.3	0.3	0.5	...	...
Beech	14.2	...	1.3	1.9	1.8	3.7	0.3	4.4	0.8
Sweetgum	133.3	...	41.2	44.2	21.7	14.1	9.2	2.5	0.4
Tupelo-blackgum	41.0	...	10.7	12.2	10.3	4.6	2.9	0.3	...
Ash	7.6	...	2.8	2.6	0.7	1.5	...	...	...
Cottonwood-aspen	0.6	...	0.3	...	...	...	0.3	...	...
Basswood	0.5	...	...	0.5	...	...	...	...	...
Yellow-poplar	63.1	...	9.2	13.0	10.1	9.4	7.2	12.2	1.9
Black walnut	0.4	...	...	...	...	0.4	...	...	...
Other hardwoods	41.0	...	8.4	11.1	7.2	7.3	3.3	3.0	0.8
Total hardwoods	1087.1	...	228.5	255.3	197.6	149.4	108.2	127.9	20.2
All species	3151.6	342.9	650.1	691.0	543.6	363.1	242.6	289.0	29.4

¹ That part of the bole of sawtimber trees between a 1-foot stump and saw-log top, including the portion of the forks large enough to contain a saw log.

Table 14—Volume of sawtimber on timberland by species and diameter class,
Central Mississippi, 1987

Species	Diameter class (inches at breast height)								
	All classes	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million board feet -----									
Longleaf-slash pines	338.5	43.6	107.5	81.5	65.1	33.6	7.1	...	...
Shortleaf-loblolly pine	11963.1	1839.7	2384.4	2558.2	2086.1	1303.1	783.2	952.0	56.3
Other yellow pines	579.0	22.3	50.3	101.1	74.8	74.6	107.9	138.0	10.0
Cypress	43.5	3.3	3.3	9.0	11.8	3.7	3.1	9.3	...
Other softwoods	29.5	16.0	5.5	4.1	3.9	...	...	...	...
Total softwoods	12953.5	1925.0	2551.0	2753.9	2241.6	1414.9	901.3	1099.4	66.3
Select white oaks	857.5	...	143.2	159.1	178.4	127.5	101.8	136.0	11.6
Select red oaks	492.2	...	59.9	77.0	93.5	78.0	63.4	103.0	17.6
Other white oaks	424.8	...	97.5	131.1	78.9	42.8	39.0	33.1	2.4
Other red oaks	2381.2	...	386.9	481.9	416.0	352.4	273.1	392.6	78.4
Hickory	557.5	...	129.5	134.3	115.1	81.6	63.0	34.0	...
Hard maple	2.6	...	...	...	2.6	...	...	...	...
Soft maple	42.7	...	29.4	6.6	1.9	1.5	3.4	...	...
Beech	92.5	...	7.0	11.2	10.9	24.3	2.2	30.1	7.0
Sweetgum	785.5	...	230.8	257.6	133.4	87.3	57.5	16.6	2.3
Tupelo-blackgum	232.8	...	57.7	69.3	59.9	27.4	17.0	1.5	...
Ash	44.2	...	14.8	15.1	4.6	9.8	...	...	...
Cottonwood-aspen	3.1	...	1.5	...	...	...	1.7	...	...
Basswood	2.7	...	...	2.7	...	...	...	...	...
Yellow-poplar	384.1	...	52.7	78.9	61.3	57.2	45.4	78.1	10.5
Black walnut	2.5	...	...	...	...	2.5	...	...	...
Other hardwoods	242.2	...	45.2	66.3	43.3	44.3	20.9	19.0	3.2
Total hardwoods	6548.2	...	1256.0	1491.1	1199.6	936.4	688.2	843.9	133.0
All species	19501.7	1925.0	3807.0	4245.0	3441.3	2351.4	1589.5	1943.3	199.3

**Table 15—Volume of growing stock and sawtimber on timberland by county and species group,
Central Mississippi, 1987**

County	Growing stock						Sawtimber					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Soft ¹	Hard ²	
		Planted	Natural					Planted	Natural			Other
-----Million cubic feet-----						-----Million board feet-----						
Attala	373.7	21.4	148.3	2.4	81.7	119.8	1254.3	61.9	655.3	2.5	182.9	351.8
Clarke	327.7	19.1	150.3	0.1	54.6	103.6	1075.8	7.6	615.7	...	144.2	308.3
Jasper	308.3	21.4	154.4	0.7	42.4	89.4	1108.7	28.6	757.4	2.2	75.3	245.2
Kemper	390.1	46.0	206.9	1.0	71.1	65.2	1553.1	156.5	1011.7	3.0	153.6	228.2
Lauderdale	589.7	6.7	316.1	0.4	96.3	170.3	2416.7	21.5	1567.8	1.7	271.3	554.5
Leake	288.1	11.5	129.9	3.2	40.4	103.2	1137.8	33.3	611.9	18.0	78.8	395.8
Neshoba	275.0	0.7	123.0	0.7	47.7	102.9	1082.0	3.6	623.4	1.7	110.5	342.7
Newton	283.3	30.7	114.6	...	42.3	95.6	1050.1	118.8	502.2	...	84.8	344.3
Noxubee	307.7	36.1	137.5	11.1	21.2	101.8	1320.2	167.0	761.5	35.1	59.5	297.0
Rankin	464.0	1.6	227.6	1.0	78.0	155.8	1884.4	3.4	1104.5	3.4	168.5	604.6
Scott	369.6	...	220.2	0.5	42.2	106.8	1472.1	...	1035.0	2.4	79.7	355.0
Simpson	221.6	4.1	129.4	...	35.6	52.5	776.7	0.9	511.6	...	63.2	201.0
Smith	404.9	11.9	266.9	0.3	46.6	79.1	1882.1	68.9	1420.8	1.3	123.9	267.2
Winston	381.0	31.5	193.2	0.4	28.1	127.7	1487.7	92.0	937.7	1.7	59.4	397.0
All counties	4984.6	242.6	2518.2	21.8	728.1	1473.9	19501.7	763.9	12116.6	73.0	1655.7	4892.6

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

**Table 16—Volume of timber on timberland by class of timber and species group,
Central Mississippi, 1987**

Class of timber	All species	Softwood			Hardwood	
		Pine			Soft ¹	Hard ²
		Planted	Natural	Other		
----- Million cubic feet -----						
Sawtimber trees:						
Saw-log portion	3151.6	127.0	1924.2	13.3	280.3	806.8
Upper-stem portion	468.6	16.2	217.5	2.2	63.1	169.5
Total	3620.2	143.2	2141.7	15.5	343.5	976.2
Poletimber trees	1364.4	99.4	376.5	6.2	384.6	497.7
All growing-stock trees	4984.6	242.6	2518.2	21.8	728.1	1473.9
Rough trees:						
Sawtimber size	267.7	4.5	61.1	2.4	51.0	148.7
Poletimber size	218.7	3.6	27.8	0.5	62.8	124.0
Total	486.4	8.1	88.9	2.9	113.8	272.7
Rotten trees:						
Sawtimber size	82.6	0.3	2.7	...	21.3	58.2
Poletimber size	7.7	...	...	...	3.3	4.4
Total	90.3	0.3	2.7	...	24.6	62.7
Salvable dead trees:						
Sawtimber size	40.7	3.1	29.1	0.5	3.1	4.8
Poletimber size	25.1	1.5	19.0	0.2	0.7	3.7
Total	65.8	4.6	48.2	0.8	3.8	8.4
All classes	5627.1	255.6	2658.0	25.4	870.4	1817.7

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 17—Volume of live trees and growing stock on timberland by ownership class and species group, Central Mississippi, 1987

Ownership class	Live trees						Growing stock					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
							</					

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 18—Average net annual growth of growing stock and sawtimber on timberland by county and species group, Central Mississippi, 1987

Growing stock							Sawtimber					
County	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
-----Million cubic feet-----							-----Million board feet-----					
Attala	22.2	2.3	10.0	0.2	3.1	6.5	90.4	8.2	49.1	0.5	9.8	22.7
Clarke	15.4	1.9	8.3	...	1.6	3.6	56.7	0.5	38.7	...	3.4	14.2
Jasper	20.0	4.5	8.3	...	1.8	5.3	83.7	14.6	48.5	...	4.5	16.1
Kemper	19.2	2.1	11.0	0.1	3.2	2.9	87.3	2.8	63.8	0.2	8.5	12.1
Lauderdale	26.2	0.7	14.4	...	3.6	7.5	135.1	3.8	91.3	...	12.0	28.0
Leake	17.5	0.5	9.7	0.1	1.5	5.7	83.3	0.1	52.4	0.3	3.5	27.0
Neshoba	11.6	...	6.9	...	0.7	4.0	67.4	...	47.5	...	0.3	19.5
Newton	15.3	0.7	7.5	...	2.2	4.9	72.3	4.0	44.6	...	4.2	19.5
Noxubee	13.6	1.0	6.3	0.5	1.0	4.8	67.8	7.2	38.0	1.8	3.6	17.3
Rankin	17.9	0.2	9.4	...	2.2	6.1	99.7	1.4	62.4	-0.1	5.2	30.8
Scott	17.9	...	9.7	...	2.8	5.4	76.7	...	52.6	0.1	5.9	18.2
Simpson	14.2	0.9	9.9	...	1.3	2.1	61.2	1.4	47.7	0.1	2.4	9.6
Smith	20.6	1.6	13.4	...	1.7	3.9	114.9	9.1	84.4	0.2	6.5	14.7
Winston	18.7	1.5	9.9	-0.1	1.2	6.2	90.9	10.2	57.6	-0.1	1.7	21.6
All counties	250.2	17.9	134.7	0.8	28.0	68.8	1187.5	63.2	778.6	3.1	71.5	271.2

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 19—Average net annual removals of growing stock and sawtimber on timberland by county and species group, Central Mississippi, 1987

County	Growing stock						Sawtimber					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine			Soft ¹	Hard ²		Pine			Soft ¹	Hard ²
		Planted	Natural	Other				Planted	Natural	Other		
-----Million cubic feet-----						-----Million board feet-----						
Attala	22.6	2.2	15.0	0.3	2.1	3.0	85.5	6.9	64.1	1.1	3.4	10.0
Clarke	19.4	0.6	12.0	...	3.3	3.5	62.8	0.6	41.0	...	9.4	11.8
Jasper	23.2	2.5	15.4	...	1.4	3.9	99.1	7.7	73.6	...	3.1	14.7
Kemper	20.2	0.1	12.1	...	3.8	4.3	71.8	...	54.5	...	8.3	9.0
Lauderdale	17.0	0.2	12.5	...	1.4	2.9	60.1	0.7	48.5	...	2.1	8.8
Leake	18.1	...	13.1	...	0.8	4.3	71.2	...	54.3	...	1.4	15.5
Neshoba	16.3	...	11.9	...	2.1	2.3	81.1	...	65.2	...	7.8	8.2
Newton	14.5	0.4	8.2	...	2.6	3.3	57.8	0.8	40.4	...	6.7	9.8
Noxubee	6.0	0.5	2.9	0.1	0.6	1.9	28.3	2.4	14.9	0.7	2.6	7.6
Rankin	12.9	0.2	10.6	...	0.2	1.9	45.7	0.6	37.7	...	0.5	6.9
Scott	16.4	0.5	12.4	...	0.2	3.4	78.2	0.7	65.8	...	0.4	11.3
Simpson	18.5	...	14.1	0.1	1.5	2.9	72.8	...	58.3	0.3	2.8	11.4
Smith	21.7	0.7	14.0	...	2.5	4.5	85.0	3.1	60.3	...	8.0	13.5
Winston	15.2	4.1	8.6	...	0.1	2.4	61.9	13.7	38.6	...	...	9.6
All counties	242.2	12.0	162.8	0.5	22.5	44.4	961.1	37.3	717.1	2.1	56.5	148.1

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 20—Average net annual growth and average annual removals of growing stock on timberland by species, Central Mississippi, 1987

Species	Growth	Removals
- - - - Million cubic feet - - - -		
Yellow pines	152.6	174.8
Other softwoods	0.8	0.5
Total softwoods	153.4	175.3
Select white-red oaks	18.0	10.2
Other white-red oaks	40.2	25.9
Hickory	5.7	5.4
Hard maple	...	...
Sweetgum	17.1	12.9
Ash-walnut-black cherry	1.4	1.2
Yellow-poplar	5.4	3.7
Other hardwoods	8.9	7.5
Total hardwoods	96.8	66.9
All species	250.2	242.2

Table 21—Average net annual growth and average annual removals of sawtimber on timberland by species, Central Mississippi, 1987

Species	Growth	Removals
- - - - Million board feet - - - -		
Yellow pines	841.8	754.5
Other softwoods	3.1	2.1
Total softwoods	844.9	756.6
Select white-red oaks	74.9	36.0
Other white-red oaks	166.9	84.9
Hickory	20.9	22.3
Hard maple	0.1	...
Sweetgum	36.4	25.2
Ash-walnut-black cherry	1.8	1.8
Yellow-poplar	22.5	16.0
Other hardwoods	19.1	18.4
Total hardwoods	342.6	204.6
All species	1187.5	961.1

Table 22—Average annual mortality of growing stock and sawtimber on timberland by species, Central Mississippi, 1987

Species	Growing stock	Sawtimber
- - Million cubic feet - - Million board feet - -		
Yellow pines	25.6	71.6
Other softwoods	0.2	0.3
Total softwoods	25.8	72.0
Select white-red oaks	1.9	3.1
Other white-red oaks	5.2	14.0
Hickory	1.4	5.7
Sweetgum	3.2	6.6
Ash-walnut-black cherry	0.6	1.3
Yellow-poplar	0.4	2.0
Other hardwoods	2.7	7.8
Total hardwoods	15.3	40.3
All species	41.1	112.3

Table 23—Average net annual growth and average annual removals of growing stock on timberland by ownership class and species group, Central Mississippi, 1987

Ownership class	Growth						Removals					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
-----Million cubic feet-----												
National forest	14.1	0.1	9.8	...	1.2	3.0	17.4	...	16.6	...	0.3	0.5
Other public	4.4	...	2.6	...	0.2	1.6	1.0	...	0.8	...	...	0.2
Forest industry	48.4	9.0	23.8	0.2	4.5	10.8	61.0	1.8	40.3	0.1	6.2	12.7
Forest industry-leased	5.4	0.5	2.0	...	0.5	2.4	7.0	...	5.0	...	0.1	1.8
Other private	178.0	8.3	96.5	0.6	21.6	50.9	155.7	10.2	100.0	0.5	15.9	29.1
All ownerships	250.2	17.9	134.7	0.8	28.0	68.8	242.2	12.0	162.8	0.5	22.5	44.4

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 24—Average net annual growth and average annual removals of sawtimber on timberland by ownership class and species, Central Mississippi, 1987

Ownership class	Growth						Removals					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine			Soft ¹	Hard ²		Pine			Soft ¹	Hard ²
		Planted	Natural	Other				Planted	Natural	Other		
-----Million board feet-----												
National forest	81.1	0.4	66.6	0.1	3.8	10.1	87.5	...	86.8	...	0.4	0.3
Other public	29.8	...	22.5	...	...	7.3	4.1	...	3.9	...	...	0.2
Forest industry	204.9	20.0	132.6	0.9	9.4	41.8	249.8	4.5	184.3	0.2	17.4	43.3
Forest industry-leased	30.2	0.1	15.9	...	1.4	12.8	28.4	...	22.9	...	...	5.5
Other private	841.5	42.3	541.0	2.1	56.9	199.1	591.3	32.8	419.1	1.9	38.6	98.8
All ownerships	1187.5	63.2	778.6	3.1	71.5	271.2	961.1	37.3	717.1	2.1	56.5	148.1

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

**Table 25—Volume of sawtimber on timberland by species and tree grade,
Central Mississippi, 1987**

Species	All grades	Grade 1	Grade 2	Grade 3	Grade 4
----- Million board feet -----					
Yellow pines	12880.5	1842.5	2313.3	8724.8	...
Cypress	43.5	...	16.9	26.6	...
Redcedar	29.5	29.5	...	...	...
Total softwoods	12953.5	1872.0	2330.2	8751.4	...
Select white-red oaks	1349.7	125.3	312.8	716.7	194.9
Other white-red oaks	2806.1	89.6	421.2	1593.3	702.0
Hickory	557.5	29.6	84.5	349.8	93.5
Hard maple	2.6	...	...	2.6	...
Sweetgum	785.5	51.2	93.0	529.4	111.9
Tupelo and blackgum	232.8	2.6	54.6	164.5	11.1
Ash-walnut-black cherry	61.1	4.2	8.8	44.0	4.1
Yellow-poplar	384.1	78.7	78.1	178.9	48.3
Other hardwoods	368.9	21.9	29.0	233.4	84.6
Total hardwoods	6548.2	403.1	1082.0	3812.6	1250.5
All species	19501.7	2275.0	3412.2	12564.0	1250.5

Supplemental Tables 26–36

**Table 26—Area of timberland by stand age, forest type group and type of regeneration,
Central Mississippi, 1987**

Stand age class	Pine		Oak-pine		Other hardwood types	
	Artificial	Natural	Artificial	Natural	Artificial	Natural
----- Thousand acres -----						
1-10	193.2	62.3	62.8	44.3	50.5	150.5
11-20	58.1	98.7	35.6	70.8	6.3	147.9
21-30	16.9	4.9	6.1	4.9	...	4.9
31-40	11.0	49.6	...	4.9	...	4.9
41-50	...	44.0	...	15.7	...	4.9
>50	...	4.9	...	...	...	...
Mixed	65.0	713.8	53.8	619.9	23.1	1462.8
Total	344.2	978.2	158.3	760.6	79.8	1775.9

Table 27—*Volume of softwood growing stock on timberland by forest type, Central Mississippi, 1987*

County	Total	Forest type group						
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum cypress
		Planted	Natural	Planted	Natural			
----- Million cubic feet -----								
Attala	172.1	...	...	14.2	102.6	35.5	19.1	0.7
Clarke	169.5	...	...	15.7	93.6	33.1	21.0	6.2
Jasper	176.5	...	...	14.6	106.9	27.7	20.8	6.6
Kemper	253.8	...	...	44.0	148.9	54.4	1.0	5.4
Lauderdale	323.2	...	...	6.7	241.6	44.0	23.2	7.6
Leake	144.5	...	...	11.3	71.8	36.5	18.0	7.0
Neshoba	124.4	...	...	...	53.8	47.2	21.0	2.4
Newton	145.3	11.4	...	15.0	66.5	37.7	5.7	8.9
Noxubee	184.7	...	...	21.3	103.7	45.4	8.0	6.2
Rankin	230.2	...	...	1.6	121.2	80.5	20.0	6.8
Scott	220.6	...	...	...	155.1	46.6	15.4	3.6
Simpson	133.5	...	...	1.7	97.1	28.4	4.8	1.4
Smith	279.2	...	21.4	11.9	173.7	59.6	12.6	...
Winston	225.2	...	5.2	19.3	103.7	74.7	18.9	3.4
All counties	2782.6	11.4	26.6	177.3	1640.0	651.4	209.6	66.2

Table 28—*Volume of hardwood growing stock on timberland by forest type, Central Mississippi, 1987*

County	Total	Forest type group						
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum cypress
		Planted	Natural	Planted	Natural			
----- Million cubic feet -----								
Attala	201.5	...	...	0.3	19.6	24.2	78.3	79.1
Clarke	158.2	...	...	...	11.7	17.6	88.4	40.4
Jasper	131.8	...	...	1.8	15.1	18.3	56.0	40.5
Kemper	136.3	...	...	2.6	26.2	39.5	16.3	51.7
Lauderdale	266.6	...	...	4.5	39.0	41.3	90.2	91.6
Leake	143.6	...	...	...	11.3	21.3	53.1	57.9
Neshoba	150.6	...	...	...	6.4	32.6	52.9	58.8
Newton	138.0	0.7	...	0.3	11.3	28.5	19.8	77.3
Noxubee	123.0	...	...	4.5	7.3	24.8	18.0	68.5
Rankin	233.8	...	...	...	17.3	57.3	75.3	83.9
Scott	148.9	...	...	...	20.0	23.1	59.8	45.9
Simpson	88.1	...	...	...	11.7	23.0	18.1	35.3
Smith	125.7	...	3.2	1.2	17.9	38.2	51.3	13.9
Winston	155.8	...	...	0.2	10.0	50.4	54.2	41.0
All counties	2202.0	0.7	3.2	15.5	224.8	440.1	731.8	785.8

Table 29—Volume of softwood growing stock in the saw-log portion of sawtimber trees on timberland by timberland by forest type, Central Mississippi, 1987

County	Total	Forest type group						
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum cypress
		Planted	Natural	Planted	Natural			
----- Million cubic feet -----								
Attala	121.7	...	...	7.4	78.8	20.5	14.4	0.6
Clarke	99.9	...	...	0.3	62.3	18.6	13.2	5.6
Jasper	124.4	...	...	4.2	87.8	14.5	11.8	6.0
Kemper	188.6	...	...	25.7	112.8	44.6	0.6	4.9
Lauderdale	250.6	...	...	3.8	186.9	33.7	20.0	6.1
Leake	107.4	...	...	5.3	51.2	28.9	15.2	6.7
Neshoba	103.7	...	...	...	42.4	41.3	17.8	2.3
Newton	102.6	7.1	...	10.1	47.0	26.8	3.7	7.8
Noxubee	148.0	...	...	13.3	84.3	37.8	7.2	5.3
Rankin	175.4	...	...	0.6	95.7	58.4	15.6	5.2
Scott	162.4	...	...	...	113.3	36.0	10.0	3.1
Simpson	84.7	...	...	...	64.8	16.4	2.8	0.7
Smith	234.1	...	16.5	10.7	143.5	52.7	10.7	...
Winston	161.1	...	4.7	6.9	85.3	50.5	10.6	3.1
All counties	2064.5	7.1	21.2	88.3	1256.1	480.9	153.5	57.4

Table 30—Volume of hardwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, Central Mississippi, 1987

County	Total	Forest type group						
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum cypress
		Planted	Natural	Planted	Natural			
----- Million cubic feet -----								
Attala	90.3	...	...	...	6.5	11.2	33.3	39.3
Clarke	75.5	...	...	...	3.1	5.8	40.3	26.3
Jasper	53.0	...	...	0.9	3.1	8.8	20.4	19.8
Kemper	64.2	...	...	0.5	8.1	18.8	9.6	27.2
Lauderdale	135.0	...	...	1.2	17.3	19.7	43.5	53.2
Leake	77.0	...	...	...	2.8	10.9	25.9	37.5
Neshoba	73.8	...	...	...	2.6	12.7	26.8	31.7
Newton	71.0	...	...	0.2	3.6	9.7	9.2	48.3
Noxubee	58.4	...	...	2.1	1.7	10.3	6.4	37.9
Rankin	131.5	...	...	...	10.7	32.8	41.7	46.4
Scott	71.7	...	...	...	5.6	6.3	31.2	28.7
Simpson	45.5	...	...	...	7.7	12.6	6.1	19.1
Smith	65.5	...	1.4	...	6.7	21.3	27.2	8.8
Winston	74.8	...	...	...	4.3	21.5	22.9	26.2
All counties	1087.1	...	1.4	4.9	83.9	202.4	344.3	450.3

**Table 31—Volume of timber on timberland by county, class of timber and species group,
Central Mississippi, 1987**

County	All classes	Growing stock		Rough		Rotten	
		Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
-----Million cubic feet-----							
Attala	422.0	172.1	201.5	2.6	38.5	...	7.3
Clarke	373.6	169.5	158.2	10.3	33.3	...	2.3
Jasper	359.1	176.5	131.8	8.5	28.9	0.9	12.5
Kemper	427.6	253.8	136.3	8.4	24.1	...	5.0
Lauderdale	647.2	323.2	266.6	9.6	33.1	0.5	14.3
Leake	320.3	144.5	143.6	5.8	21.5	...	5.0
Neshoba	336.8	124.4	150.6	13.2	40.6	...	8.0
Newton	318.7	145.3	138.0	6.8	22.2	1.4	5.2
Noxubee	332.5	184.7	123.0	4.3	16.0	...	4.6
Rankin	499.9	230.2	233.8	6.0	26.4	...	3.4
Scott	410.0	220.6	148.9	9.5	25.4	...	5.6
Simpson	243.3	133.5	88.1	0.7	19.1	...	1.9
Smith	444.7	279.2	125.7	7.8	28.5	...	3.5
Winston	425.4	225.2	155.8	6.4	29.0	0.3	8.7
All counties	5561.4	2782.6	2202.0	99.9	386.6	3.1	87.3

Table 32—Number of live trees on timberland by detailed species and diameter class, Central Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----													
Longleaf pine	3280	500	...	460	581	405	606	427	196	85	20	...	...
Slash pine	1716	...	527	...	442	297	312	45	80	13	...	...	...
Shortleaf pine	92727	28855	13845	14838	14219	9892	5963	2805	1679	481	79	70	...
Loblolly pine	453237	187487	109524	58852	35325	21306	15560	11773	6753	3346	1757	1501	53
Spruce pine	7333	2190	540	1228	889	555	464	511	331	199	221	197	9
Redcedar	18377	12980	2449	1697	453	582	110	41	66	...	...	...	...
Cypress	302	...	...	110	...	35	29	40	46	13	10	18	...
Total softwoods	576971	232013	126885	77185	51908	33072	23043	15642	9152	4136	2087	1787	62
Select white oaks	84464	46317	16080	7398	5096	3046	2213	1578	1174	593	398	527	44
Select red oaks	27549	11137	6452	3062	2135	1858	975	583	554	284	208	261	40
Other white oaks	72186	38270	12443	8010	5457	3314	1951	1340	738	315	182	149	15
Other red oaks	303543	202983	38198	22056	12484	9437	6658	4615	2615	1761	1127	1351	256
Sweet pecan	502	502	...	...	...	...	...	...	...	...	...	...	...
Water hickory	1158	1054	...	85	...	...	...	19	...	...	...	...	...
Other hickories	140628	107330	15125	7296	3539	2711	1951	1209	694	408	227	138	...
Persimmon	42688	36214	5024	981	273	196	...	...	...	...	...	...	...
Hard maple	577	...	562	...	...	...	...	...	15	...	...	...	...
Soft maple	198372	151167	30700	10973	3083	1437	726	182	46	25	18	15	...
Boxelder	3046	1631	531	487	130	151	85	20	...	12	...	...	...
Beech	5359	3289	531	424	81	74	149	166	185	182	77	174	28
Sweetgum	502201	328950	98525	39508	18861	8768	3751	2228	885	368	232	112	13
Blackgum	152974	124299	16023	5252	3549	2110	796	498	256	112	59	20	...
Other gums/tupelos	6601	972	1571	1903	624	597	400	201	181	71	41	40	...
White ash	7729	4389	2689	389	...	121	...	105	16	14	...	6	...
Other ashes	43763	33277	7007	1559	935	472	325	96	33	40	11	8	...
Sycamore	1766	974	...	212	115	159	61	102	66	25	19	33	...
Cottonwood	214	...	...	...	172	...	32	...	...	...	10	...	...
Basswood	583	510	...	...	51	...	...	22	...	...	...	...	...
Yellow-poplar	53862	41383	4271	3246	1566	1082	691	642	358	216	201	180	27
Magnolia	809	...	500	113	82	86	...	...	...	27	...	...	...
Sweetbay	21450	14358	3862	1141	641	501	413	345	114	50	12	14	...
Willow	10332	4559	4733	506	452	47	28	...	...	...	...	8	...
Black walnut	61	...	...	...	...	...	49	...	...	12	...	...	...
Black cherry	38186	29979	4266	2249	1038	482	83	21	35	25	...	8	...
American elm	9186	5754	1091	668	871	342	173	158	47	54	19	10	...
Other elms	83552	69846	7869	3291	1328	732	171	164	77	65	9	...	...
River birch	1886	1720	...	108	...	...	...	40	...	...	10	8	...
Hackberry	6964	4757	540	568	389	277	271	25	28	49	19	29	12
Other locusts	1116	1037	...	...	79	...	...	...	...	...	...	...	...
Sassafras	22388	18258	2848	968	238	41	...	20	16	...	...	...	...
Dogwood	141972	115113	22253	3871	736	...	...	...	...	...	...	...	...
Holly	11937	8467	2610	246	495	85	26	...	...	...	...	9	...
Other commercial	10827	7698	1627	818	353	167	58	44	49	13	...	...	...
Total hardwoods	2010435	1416193	307932	127389	64853	38293	22039	14424	8182	4720	2879	3097	436
Noncommercial	221236	183168	20347	12404	3398	1250	348	120	131	60	10	...	...
All species	2808642	1831373	455164	216978	120159	72615	45431	30186	17464	8915	4976	4884	498

Table 33—Number of growing-stock trees on timberland by detailed species and diameter class,
Central Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)									
		5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
		-----Million cubic feet-----									
Longleaf pine	2718	460	581	367	606	403	196	85	20	...	...
Slash pine	1162	...	442	297	284	45	80	13	...	...	...
Shortleaf pine	45816	11352	13656	9802	5932	2786	1665	481	79	62	...
Loblolly pine	144717	53054	32995	19782	14764	11283	6534	3178	1669	1412	45
Spruce pine	4340	1228	761	515	464	468	293	199	212	191	9
Redcedar	2634	1620	396	461	84	41	32	...	...	...	...
Cypress	302	110	...	35	29	40	46	13	10	18	...
Total softwoods	201688	67825	48830	31259	22163	15067	8847	3968	1991	1684	54
Select white oaks	19350	6408	4630	2802	2009	1285	1021	542	317	326	11
Select red oaks	8748	2586	1929	1529	924	566	523	284	198	189	20
Other white oaks	16898	5972	4442	2806	1504	1199	536	204	162	70	3
Other red oaks	53424	18777	10921	8506	5619	4044	2248	1433	912	877	87
Water hickory	85	85	...	...	...	...	...	...	...	...	...
Other hickories	15138	5738	3184	2291	1734	1010	619	308	186	69	...
Persimmon	1113	644	273	196	...	...	...	...	...	...	...
Hard maple	15	...	...	...	...	...	15	...	...	...	...
Soft maple	8791	5672	1743	866	409	59	18	14	9	...	...
Boxelder	425	107	130	112	56	20	...	...	...	...	...
Beech	875	289	81	42	100	111	66	109	9	61	7
Sweetgum	61056	30664	16364	7792	3089	1974	669	300	162	38	4
Blackgum	8274	2640	2682	1626	614	420	199	74	19	...	...
Other gums/tupelos	2753	1112	491	477	244	159	165	55	41	8	...
White ash	516	283	...	121	...	82	16	14	...	...	...
Other ashes	2616	1158	759	352	244	61	17	26	...	...	...
Sycamore	614	212	56	120	31	64	66	25	19	20	...
Cottonwood	214	...	172	...	32	...	...	...	10	...	...
Basswood	74	...	51	...	...	22	...	...	...	...	...
Yellow-poplar	6805	2557	1379	911	628	517	304	216	128	149	15
Magnolia	294	113	82	86	...	...	...	13	...	...	...
Sweetbay	1455	469	276	291	216	144	47	12	...	...	...
Willow	591	279	284	...	28	...	...	...	...	...	...
Black walnut	12	...	...	...	...	...	...	12	...	...	...
Black cherry	2100	1086	540	327	83	21	18	25	...	...	...
American elm	1710	420	730	264	85	115	30	41	19	5	...
Other elms	4456	2571	905	665	75	119	60	52	9	...	...
River birch	50	...	...	...	...	40	...	...	10	...	...
Hackberry	1331	568	260	242	159	25	14	36	10	9	8
Sassafras	1006	802	126	41	...	20	16	...	...	...	...
Dogwood	1375	1298	77	...	...	...	...	...	...	...	...
Holly	488	246	202	39	...	...	...	...	...	...	...
Other commercial	44	...	...	44	...	...	...	...	...	...	...
Total hardwoods	222697	92758	52771	32549	17885	12077	6667	3796	2221	1820	155
All species	424385	160582	101601	63808	40048	27144	15514	7765	4211	3504	209

**Table 34—Volume of growing-stock trees on timberland by species and diameter class,
Central Mississippi, 1987**

Species	Diameter class (inches at breast height)										
	All classes	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million cubic feet -----											
Longleaf pine	50.6	1.2	4.1	5.5	13.8	12.6	7.5	4.6	1.2	...	...
Slash pine	20.3	...	4.2	4.1	6.1	1.5	3.5	0.8	...	...	...
Shortleaf pine	625.1	36.4	104.2	144.9	133.3	91.4	74.7	27.8	6.2	6.3	...
Loblolly pine	1958.5	124.2	193.1	257.5	305.6	348.1	272.9	183.7	119.5	145.1	8.8
Spruce pine	106.3	3.8	4.6	5.5	9.7	17.1	12.6	12.4	17.0	22.0	1.6
Redcedar	13.2	3.8	2.2	4.2	1.3	0.8	0.8	...	...	...	...
Cypress	8.6	0.3	...	0.8	0.6	1.6	2.2	0.7	0.6	1.9	...
Total softwoods	2782.6	169.7	312.4	422.6	470.4	473.1	374.1	230.0	144.6	175.3	10.4
Select white oaks	244.7	16.9	27.6	30.7	35.1	32.7	34.7	23.4	18.5	23.4	1.6
Select red oaks	132.2	7.1	11.8	16.8	16.7	15.6	18.0	14.7	11.0	17.3	3.1
Other white oaks	152.0	14.3	24.1	28.1	22.4	26.4	15.5	8.1	7.2	5.5	0.5
Other red oaks	679.4	48.3	63.3	93.1	98.1	99.4	78.8	65.7	50.7	68.9	13.0
Water hickory	0.5	0.5	...	...	...	...	...	...	...	...	...
Other hickories	168.2	12.6	17.7	26.3	31.0	26.8	22.3	14.8	11.2	5.6	...
Persimmon	5.9	1.8	1.7	2.4	...	...	...	...	...	...	...
Hard maple	0.4	...	...	...	...	...	0.4	...	...	...	...
Soft maple	42.7	14.3	9.8	9.4	6.5	1.2	0.4	0.4	0.7	...	...
Boxelder	3.8	0.4	0.9	1.3	0.8	0.4	...	...	...	...	...
Beech	19.6	1.0	0.4	0.4	1.8	2.4	2.1	4.6	0.4	4.9	1.7
Sweetgum	415.0	67.2	95.5	84.9	58.9	54.1	25.1	15.8	10.2	2.9	0.4
Blackgum	68.2	5.8	13.3	18.2	10.2	9.6	6.6	3.4	1.1	...	...
Other gums/tupelos	28.9	3.3	2.8	4.8	4.4	4.5	4.7	1.9	2.3	0.3	...
White ash	5.2	0.6	...	1.5	...	2.0	0.5	0.7	...	...	...
Other ashes	18.8	3.1	4.3	4.2	4.1	1.5	0.4	1.1	...	...	...
Sycamore	12.6	0.6	0.5	2.0	0.7	1.5	2.3	1.4	1.4	2.3	...
Cottonwood	2.7	...	1.6	...	0.7	...	...	...	0.4	...	...
Basswood	0.9	...	0.4	...	...	0.5	...	...	...	...	...
Yellow-poplar	100.8	7.5	9.4	11.0	12.5	15.3	11.3	10.7	7.9	13.3	2.0
Magnolia	1.9	0.3	0.3	0.8	...	...	...	0.5	...	...	...
Sweetbay	15.5	1.1	1.9	3.4	3.7	3.5	1.5	0.5	...	...	...
Willow	2.8	0.5	1.7	...	0.6	...	...	...	...	...	...
Black walnut	0.5	...	...	...	...	...	...	0.5	...	...	...
Black cherry	11.9	2.8	2.8	3.2	1.4	0.5	0.4	0.8	...	...	...
American elm	16.2	1.2	4.2	2.7	1.4	2.7	1.0	1.4	1.1	0.5	...
Other elms	29.1	6.2	5.0	7.3	1.6	3.7	2.3	2.5	0.5	...	...
River birch	1.4	...	...	...	...	0.9	...	...	0.5	...	...
Hackberry	12.4	1.3	1.4	2.6	2.4	0.4	0.5	1.7	0.5	0.6	0.9
Sassafras	3.8	1.4	0.9	0.3	...	0.6	0.6	...	...	...	...
Dogwood	2.3	2.1	0.2	...	...	...	...	...	...	...	...
Holly	1.5	0.5	0.8	0.2	...	...	...	...	...	...	...
Other commercial	0.2	...	...	0.2	...	...	...	...	...	...	...
Total hardwoods	2202.0	222.3	304.2	355.8	315.0	306.3	229.5	174.6	125.6	145.6	23.2
All species	4984.6	392.0	616.7	778.4	785.4	779.3	603.6	404.6	270.2	320.9	33.6

Table 35—Volume of growing stock in the saw-log portion of sawtimber trees on timberland by detailed species and diameter class, Central Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)							
		9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million cubic feet -----									
Longleaf pine	41.1	4.6	12.4	11.5	6.9	4.5	1.2	...	...
Slash pine	14.0	3.2	5.5	1.5	3.3	0.6	...	...	...
Shortleaf pine	432.6	120.8	121.2	84.4	68.8	25.9	5.8	5.7	...
Loblolly pine	1474.2	206.1	272.6	320.4	252.7	170.6	110.9	133.1	7.7
Spruce pine	89.3	4.3	8.4	15.7	11.4	11.4	16.0	20.7	1.4
Redcedar	5.7	3.2	1.0	0.8	0.7	...	...	...	...
Cypress	7.6	0.7	0.6	1.4	2.1	0.6	0.5	1.7	...
Total softwoods	2064.5	342.9	421.6	435.7	346.0	213.7	134.4	161.1	9.2
Select white oaks	140.1	...	26.3	27.1	29.2	19.8	15.6	20.4	1.6
Select red oaks	80.6	...	11.3	13.2	15.8	12.4	10.1	15.3	2.5
Other white oaks	72.4	...	17.9	22.9	13.3	6.8	6.2	4.8	0.4
Other red oaks	393.7	...	70.8	83.0	68.5	56.5	42.9	60.1	11.7
Other hickories	90.6	...	22.9	22.2	18.3	12.7	9.6	4.9	...
Hard maple	0.4	...	...	...	0.4	...	...	...	...
Soft maple	6.7	...	4.6	1.0	0.3	0.3	0.5	...	...
Boxelder	0.9	...	0.7	0.2	...	...	...	...	...
Beech	14.2	...	1.3	1.9	1.8	3.7	0.3	4.4	0.8
Sweetgum	133.3	...	41.2	44.2	21.7	14.1	9.2	2.5	0.4
Blackgum	25.5	...	7.6	8.2	5.9	3.0	0.9	...	...
Other gums/tupelos	15.4	...	3.2	4.1	4.4	1.6	1.9	0.3	...
White ash	2.5	...	...	1.5	0.4	0.6	...	...	...
Other ashes	5.1	...	2.8	1.0	0.4	0.9	...	...	...
Sycamore	7.7	...	0.5	1.2	2.0	1.1	1.1	1.9	...
Cottonwood	0.6	...	0.3	...	...	...	0.3	...	...
Basswood	0.5	...	...	0.5	...	...	...	...	...
Yellow-poplar	63.1	...	9.2	13.0	10.1	9.4	7.2	12.2	1.9
Magnolia	0.5	...	...	...	...	0.5	...	...	...
Sweetbay	7.3	...	2.4	3.0	1.4	0.4	...	...	...
Willow	0.4	...	0.4	...	...	...	...	...	...
Black walnut	0.4	...	...	...	...	0.4	...	...	...
Black cherry	2.5	...	1.0	0.4	0.4	0.7	...	...	...
American elm	6.6	...	1.2	2.0	0.9	1.2	1.0	0.5	...
Other elms	8.2	...	1.2	2.9	1.7	2.0	0.4	...	...
River birch	1.2	...	...	0.8	...	...	0.4	...	...
Hackberry	5.6	...	1.7	0.4	0.4	1.3	0.4	0.5	0.8
Sassafras	1.0	...	...	0.5	0.5	...	...	...	...
Total hardwoods	1087.1	...	228.5	255.3	197.6	149.4	108.2	127.9	20.2
All species	3151.6	342.9	650.1	691.0	543.6	363.1	242.6	289.0	29.4

**Table 36—Volume of timber on timberland by species and class of timber,
Central Mississippi, 1987**

Species	All live	Growing stock	Rough	Rotten
----- Million cubic feet -----				
Longleaf pine	51.2	50.6	0.7	...
Slash pine	20.9	20.3	0.6	...
Shortleaf pine	637.1	625.1	12.0	...
Loblolly pine	2040.9	1958.5	79.9	2.5
Spruce pine	110.7	106.3	3.8	0.6
Redcedar	16.1	13.2	2.9	...
Cypress	8.6	8.6	...	...
Total softwoods	2885.5	2782.6	99.9	3.1
Select white oaks	280.1	244.7	26.6	8.8
Select red oaks	145.0	132.2	11.9	1.0
Other white oaks	181.6	152.0	23.7	5.9
Other red oaks	792.1	679.4	87.0	25.7
Water hickory	0.9	0.5	0.4	...
Other hickories	194.4	168.2	16.8	9.5
Persimmon	6.7	5.9	0.8	...
Hard maple	0.4	0.4	...	...
Soft maple	69.5	42.7	24.0	2.8
Boxelder	5.8	3.8	2.0	...
Beech	37.2	19.6	10.4	7.2
Sweetgum	475.8	415.0	49.9	10.9
Blackgum	84.9	68.2	13.2	3.6
Other gums/tupelos	36.3	28.9	6.5	0.9
White ash	6.1	5.2	0.9	...
Other ashes	24.4	18.8	5.2	0.3
Sycamore	15.2	12.6	1.9	0.7
Cottonwood	2.7	2.7	...	...
Basswood	0.9	0.9	...	...
Yellow-poplar	115.6	100.8	11.6	3.1
Magnolia	2.1	1.9	0.2	...
Sweetbay	28.1	15.5	9.6	3.0
Willow	4.3	2.8	1.5	...
Black walnut	0.8	0.5	0.4	...
Black cherry	17.2	11.9	4.8	0.6
American elm	20.6	16.2	3.7	0.7
Other elms	34.4	29.1	4.9	0.3
River birch	1.9	1.4	0.3	0.2
Hackberry	15.9	12.4	3.2	0.3
Other locusts	0.3	...	0.3	...
Sassafras	4.3	3.8	0.6	...
Dogwood	7.9	2.3	5.5	...
Holly	3.6	1.5	1.7	0.4
Other commercial	4.7	0.2	3.0	1.4
Total hardwoods	2621.7	2202.0	332.4	87.3
Noncommercial	54.2	...	54.2	...
All species	5561.4	4984.6	486.4	90.3

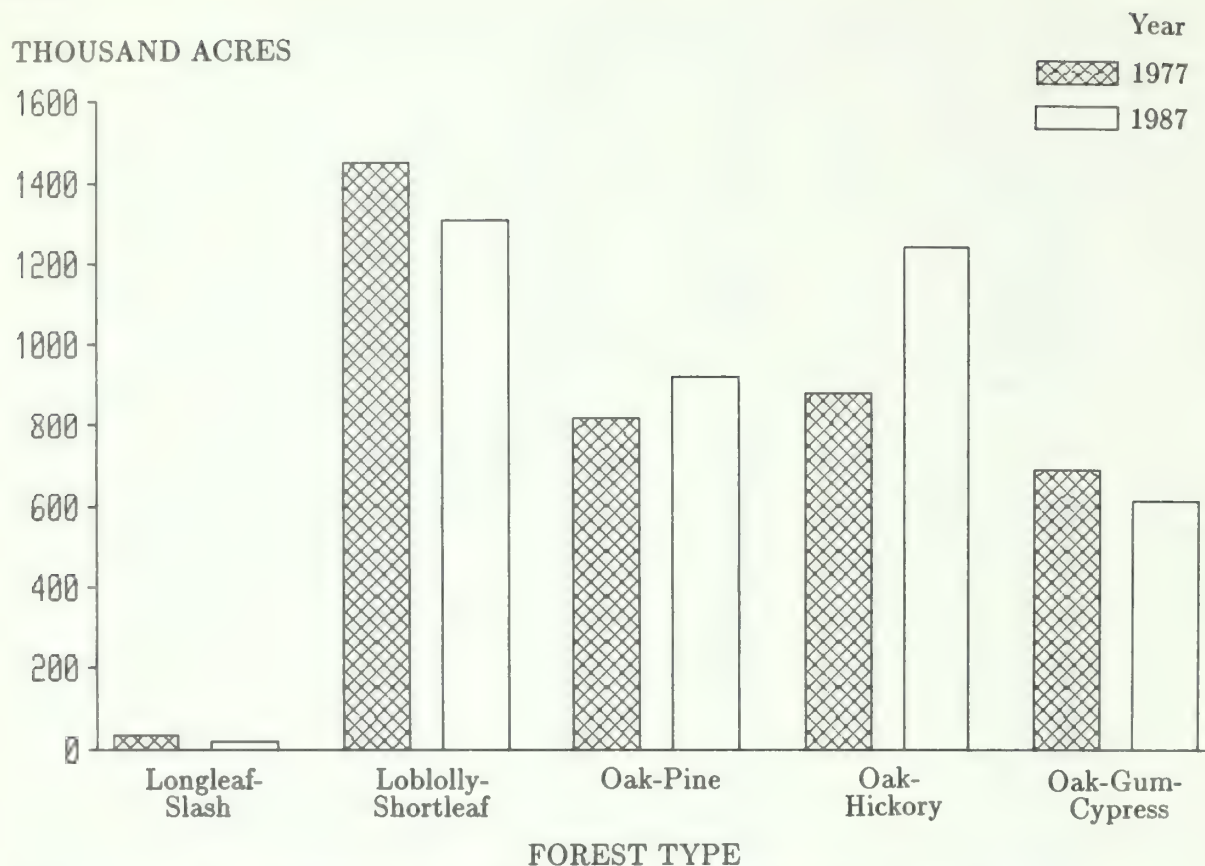


Figure 1.—Area of timberland by forest type, Central Mississippi, 1977 and 1987.

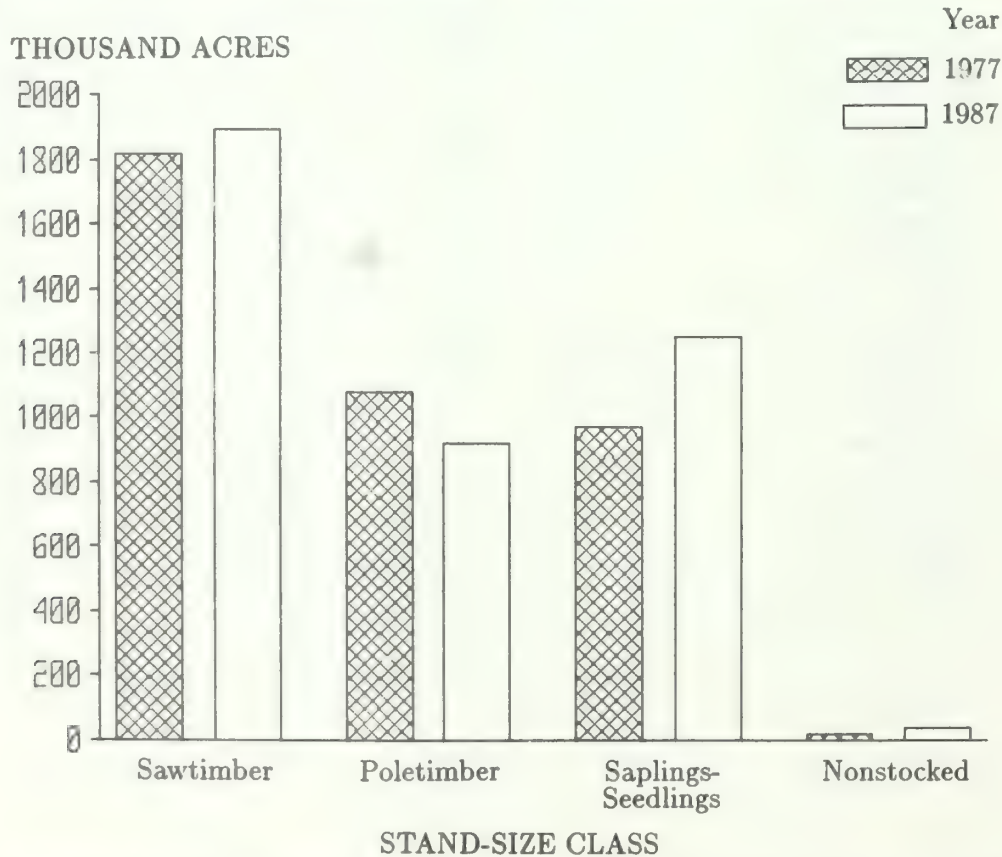


Figure 2.—Area of timberland by stand-size class, Central Mississippi, 1977 and 1987.

MILLION CUBIC FEET

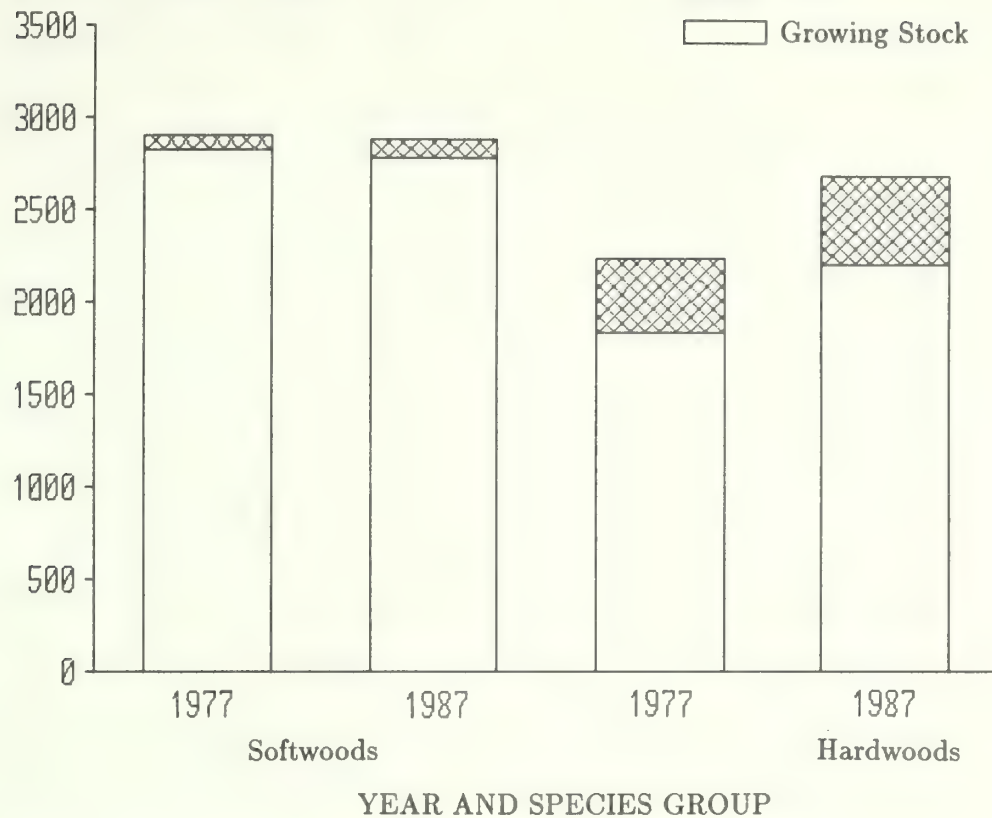


Figure 3.—Volume of timber on timberland by species group and class of timber, Central Mississippi, 1977 and 1987.

MILLION CUBIC FEET

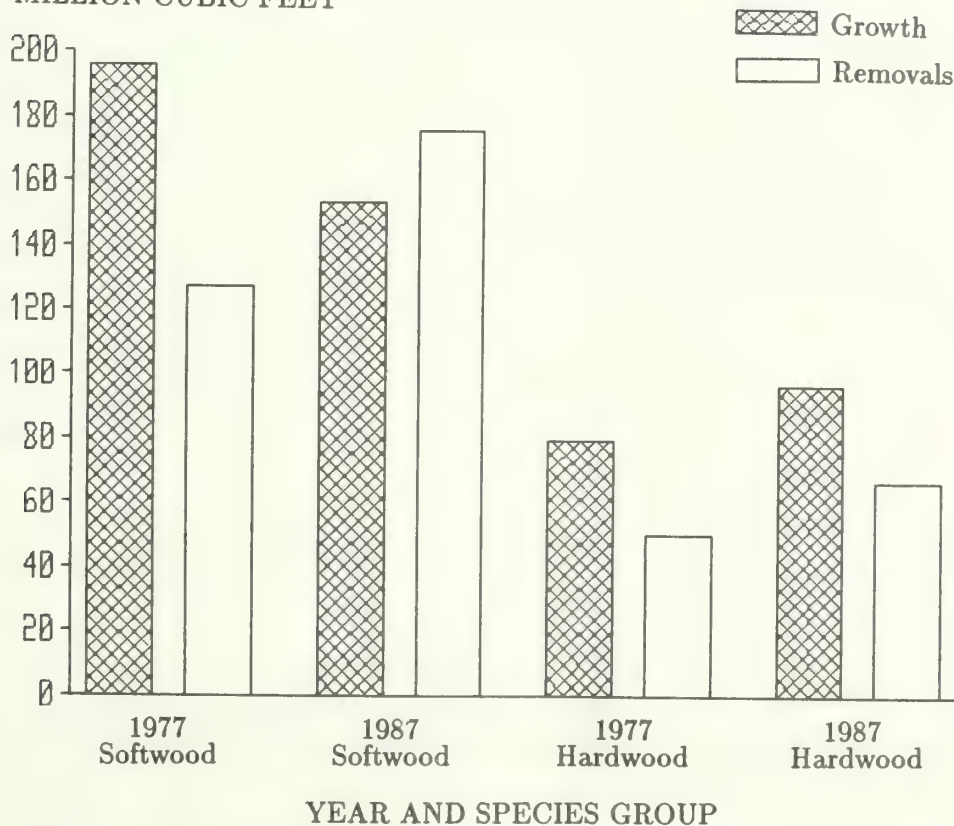


Figure 4.—Average net annual growth and average annual removals of growing stock on timberland by species group, Central Mississippi, 1977 and 1987.

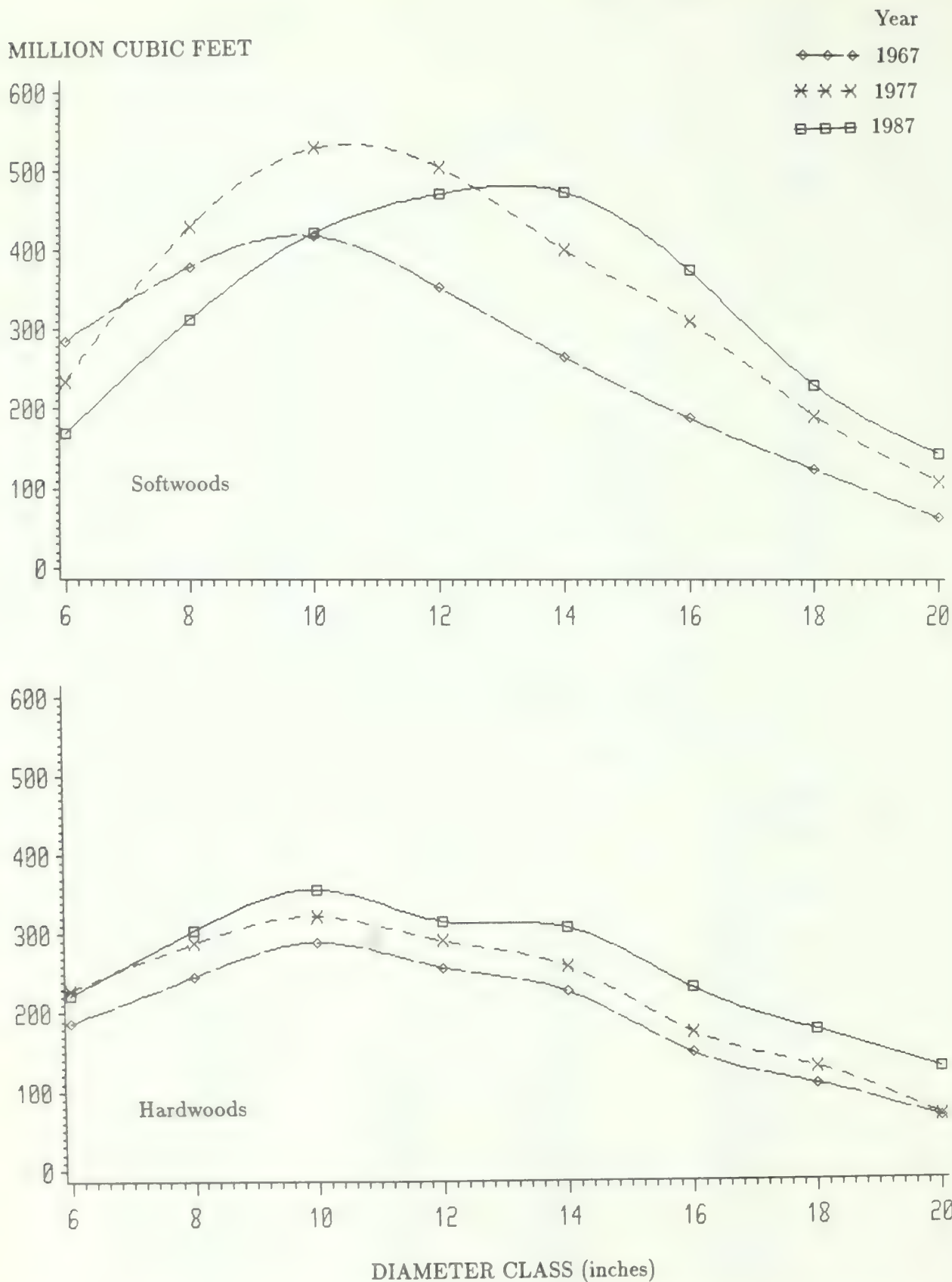


Figure 5.—Volume of softwood and hardwood growing stock on timberland by diameter class, Central Mississippi, 1967, 1977, and 1987.

MILLION TREES

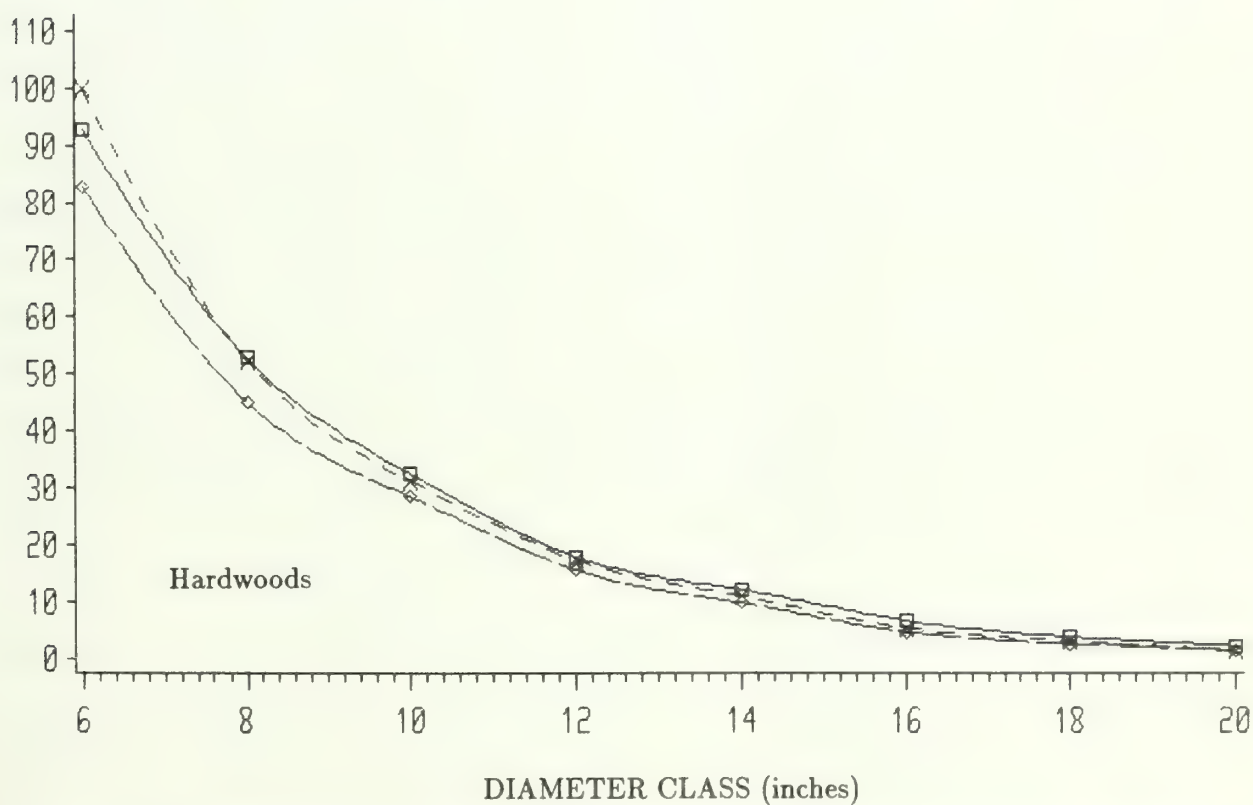
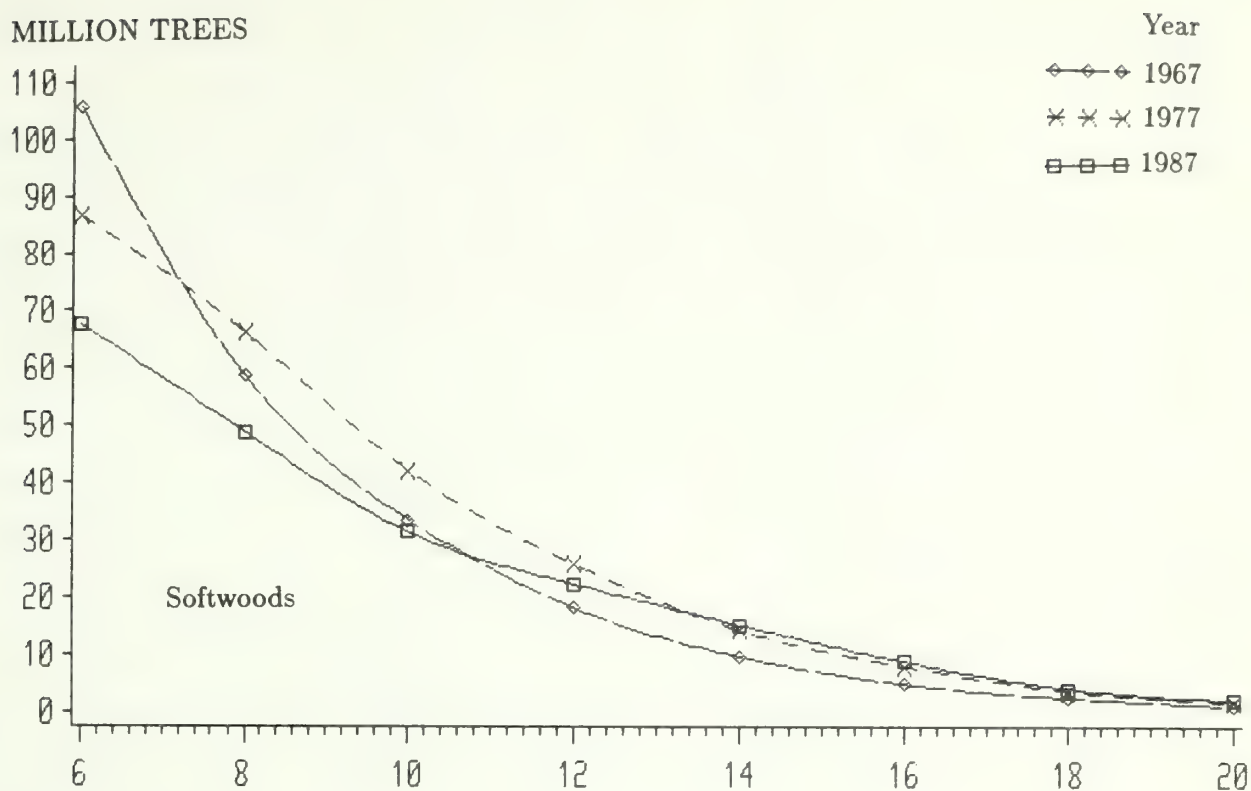


Figure 6.—Number of softwood and hardwood growing stock trees on timberland by diameter class, Central Mississippi, 1967, 1977, and 1987.

PERCENT CHANGE

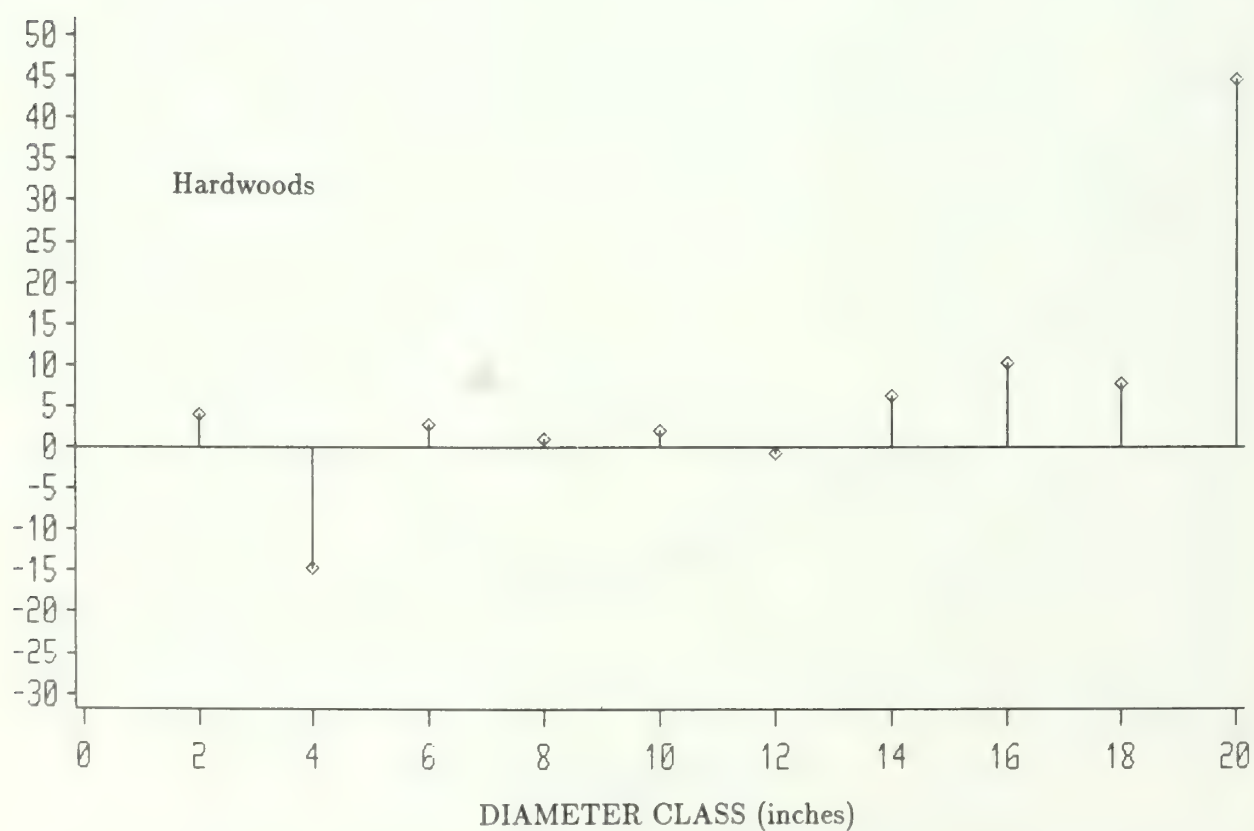
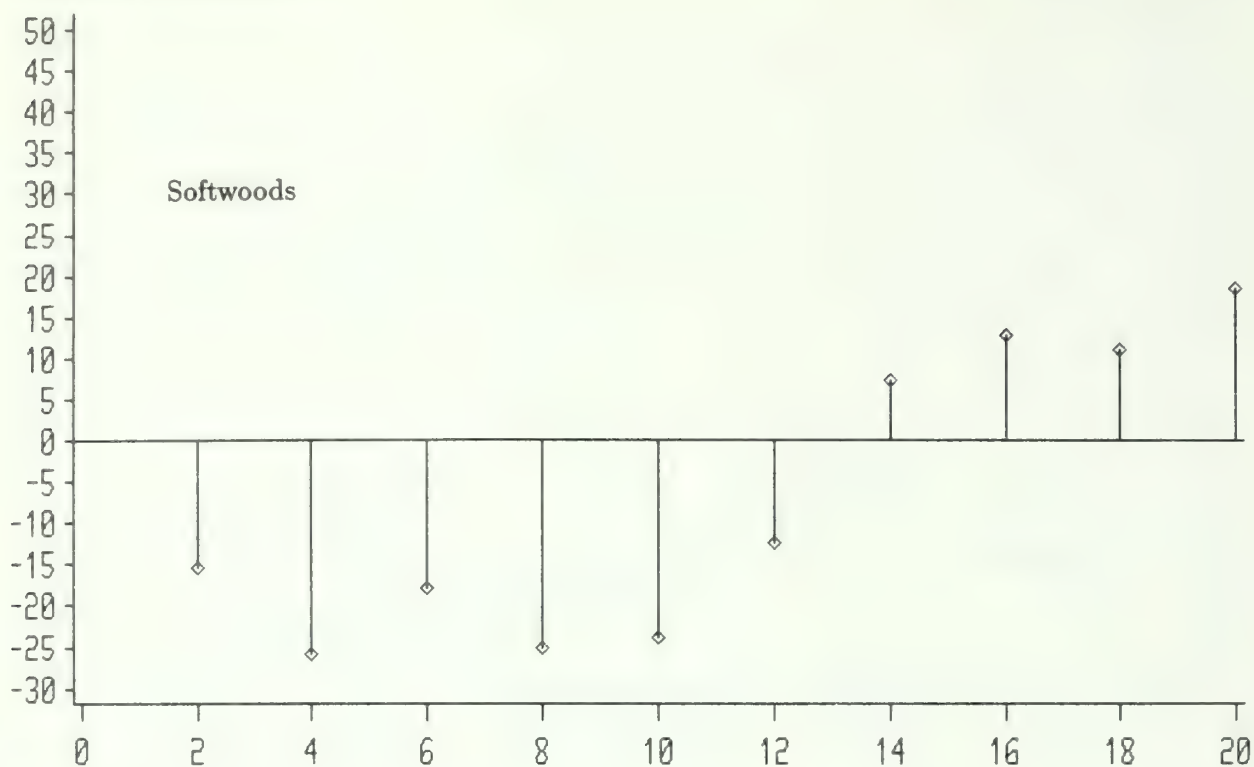


Figure 7.—Percent change in the number of live softwood and hardwood trees by diameter class, Central Mississippi, 1977 to 1987.

ACKNOWLEDGMENTS

The Southern Station gratefully acknowledges the cooperation and assistance provided by the Mississippi Forestry Commission and forest industries in collecting field data. Appreciation is also expressed for the cooperation of other public agencies and other private landowners in providing access to the sample locations.

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Tabulates forest resource information from a new inventory of Central Mississippi counties.

Additional Keywords: Area, volume, forest type, stand size, ownership.

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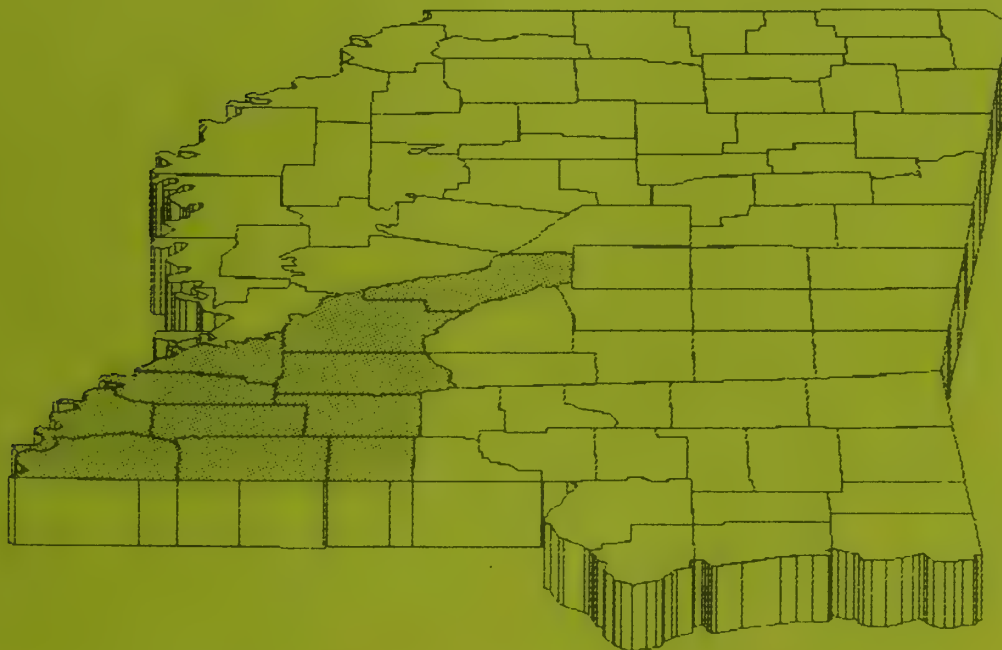
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Forest Statistics for Southwest Mississippi Counties - 1987

John F. Kelly and F. Dee Hines



SUMMARY

The 1987 survey of the 11 counties in the Southwest Mississippi unit indicated the following changes since the previous survey in 1977:

- * Timberland area, now covering 2,766.0 thousand acres, is approximately the same.
- * Forest industry-owned land increased 13 percent.
- * Oak-hickory forest type increased by 266.1 thousand acres, or 32 percent.
- * Pine and oak-pine forest types decreased 3 percent and 13 percent, respectively.
- * Oak-gum-cypress forest type decreased 29 percent.
- * Sawtimber stands increased 8 percent; they now account for 61 percent of total timberland.
- * Softwood growing-stock volume decreased 7 percent.
- * Hardwood growing-stock volume increased 25 percent.
- * Net growth of softwoods decreased 30 percent, while hardwood growth increased 33 percent.
- * Removals increased 25 percent.
- * Softwood removals now exceed growth by 4 percent.
- * Mortality increased 35 percent, due to softwood changes.

FOREWORD

The Southern Forest Survey, an activity of the Southern Forest Experiment Station Forest Inventory and Analysis work unit, covers the States of Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, Tennessee, and East Texas, and the island of Puerto Rico.

This survey is part of the nationwide Forest Survey originally authorized by the McSweeney-McNary Act of 1928. More recent legislation pertinent to the survey mission includes the Forest and Rangeland Renewable Resources Planning Act of 1974 and the Forest and Rangeland Renewable Resources Research Act of 1978. The survey mission is to develop, analyze, and maintain renewable forest resource information. This information is essential for formulation of forest policies and programs.

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*Core tables are presented in response to the Southern Industrial Forestry Research Council's recommendations. These tables are identical among Forest Inventory and Analysis units in the eastern United States.

Forest Statistics for Southwest Mississippi Counties—1987

John F. Kelly and F. Dee Hines

INTRODUCTION

The tables in this report were derived from data obtained from an inventory of 11 counties comprising the Southwest Mississippi Unit (fig. 1). The data on forest acreage and timber volume were secured by a three-step process. A forest-nonforest classification was accomplished on aerial photographs for points representing approximately 230 acres. These photo classifications were adjusted on the basis of ground observations at sample locations representing approximately 3,840 acres. Finally, forest locations at the intersections of a grid of lines spaced 3 miles apart were subjected to on-the-ground measurements. At these forest locations, per-acre estimates were obtained from trees measured on ten 37.5 basal area factor prism points.

The sampling methods were designed to achieve suitable sampling errors for estimates of area and volume at the State level. Sampling error increases as the area or volume considered decreases. The sampling errors presented in table I, equal to one standard deviation for the sample data, may be used to construct confidence intervals for population parameters. For example, at the 95 percent confidence level, the confidence interval for growing-stock volume (in million cubic feet) in the Southwest Unit (with a sampling error of 3.7 percent) is

$$3,807.1 \pm 1.96(0.037 \times 3,807.1) = \\ 3,807.1 \pm 276.1$$

where 1.96 is the number of standard deviations. This confidence interval indicates that the actual growing-stock volume lies in the range 3,531.0 to 4,083.2 million cubic feet,

Table I—Sampling errors¹ for timberland, growing stock, and sawtimber, Southwest Mississippi, 1987

County	Timberland	Growing stock			Sawtimber volume
		Volume	Growth	Removals	
----- <i>Percent</i> -----					
Adams	2.3	16.4	11.6	26.0	20.2
Amite	2.3	9.7	8.7	19.7	11.1
Claiborne	2.1	9.3	9.5	30.6	10.5
Copiah	1.9	9.0	7.0	13.1	10.8
Franklin	2.4	9.7	9.8	21.3	11.3
Hinds	1.7	11.9	17.8	29.6	14.3
Jefferson	2.7	11.6	11.2	27.2	15.2
Lincoln	3.3	15.3	12.3	27.6	17.5
Madison	1.7	14.3	13.3	27.9	17.0
Pike	4.3	16.3	18.7	32.6	20.8
Wilkinson	1.7	10.7	11.2	21.4	12.0
All counties	0.7	3.7	3.4	7.3	4.5

¹ By random-sampling formula.

unless a 1-in-20 chance of a random event has occurred.

Sampling errors for sub-groups of counties in the unit may be estimated by the following:

$$SE_g = \frac{SE_t \sqrt{X_t}}{\sqrt{X_g}}$$

where:

- SE = standard error of estimate
(expressed as a percent)
- X = variable of interest
(area or volume)
- g = group of counties to be combined
- t = total for the unit.

For comparative purposes, the 1977 survey data, collected from the last complete forest survey of Mississippi, was reprocessed according to current procedures. These procedures included the use of the same methods for estimating growth and removals. Thus, differences between the 1977 and 1987 data should reflect resource changes and not data processing differences. The results from the reprocessed 1977 survey data were used for comparison to the 1987 data in the Highlights that follow.

HIGHLIGHTS

Timberland Area

Total timberland in Southwest Mississippi covers 2,766.0 thousand acres, which is only a small change from 1977. The region is now 63 percent forested.

Some minor shifts in ownership of timberland have occurred since 1977, notably with forest industry and other public ownerships. Forest industry timberland has increased 13 percent. Other publicly-owned timberland—which excludes National Forests—has increased from 55.8 thousand acres in 1977 to 120.7 thousand acres in 1987. Timberland in the other private category decreased 4 percent.

Changes in forest type since 1977 are evident. The area of oak-hickory forest type increased 32 percent, from 822.4 thousand acres to 1,088.5 thousand acres. Other upland forest types have decreased: the oak-pine type decreased 13 percent, and pine forest types decreased 3 percent. The oak-gum-cypress type also decreased, from 506.3 thousand acres to 359.5 thousand acres. The elm-ash-cottonwood type remained about the same, covering 32.8 thousand acres.

Southwest Mississippi forests are increasingly dominated by sawtimber-size stands, although there was also a small increase in sapling-seedling stands. Sawtimber stands increased 8 percent and currently account for 61 percent of total timberland. Sapling-seedling stands increased 3 percent to 561.0 thousand acres. Poletimber stands, on the other hand, decreased 19 percent, from 629.2 thousand acres to 507.4 thousand acres.

Contributing to the increase in sapling-seedling stands was the increase in plantations. Planted stands increased from 68.4 thousand acres in 1977 to 213.6 thousand acres in 1987. These stands now account for 8 percent of total timberland.

Number of Trees

The number of all live trees in Southwest Mississippi has declined since 1977. The number of softwood live trees decreased 11 percent, but there were increases in some diameter-at-breast-height (d.b.h.) classes—the 2-inch, 20-inch, and larger classes. The number of hardwood live trees decreased 10 percent; the decreases were in the 14-inch and smaller d.b.h. classes, except for the 10-inch class which increased.

The number of growing-stock trees also decreased. Softwood growing-stock trees decreased 18 percent, with decreases in all d.b.h. classes below the 20-inch class. Hardwood growing-stock trees decreased 46 percent; although decreases were concentrated in tree sizes below 5 inches, decreases were evident through the 8-inch d.b.h. class.

Timber Volume

Softwood growing-stock volume decreased 7 percent since 1977. The change was from 1,902.7 million cubic feet previously to 1,773.0 million cubic feet currently. The decrease in softwood growing-stock volume for the current survey is in contrast to the 30 percent increase indicated for the period 1967-1977. Softwood sawtimber increased by a small amount, about 2 percent from 1977 to 1987. Softwood sawtimber increased 44 percent from 1967 to 1977.

Hardwood growing-stock volume increased 25 percent since 1977, similar to the 28 percent increase from 1967 to 1977. Current hardwood growing-stock volume is 2,034.0 million cubic feet, up from 1,621.3 million cubic feet in 1977. Hardwood sawtimber has likewise increased 35 percent since 1977. Hardwood sawtimber increased 32 percent from 1967 to 1977.

The volume of cull trees has increased 14 percent since 1977. Softwood cull volume increased 7 percent, while hardwoods increased 15 percent. Hardwoods account for 89 percent of total volume in cull trees.

Growth, Removals, and Mortality

Total net annual growth decreased 7 percent compared to the 1977 estimates, with the entire decrease attributable to softwoods; hardwood growth increased. Growth is calculated as an annual average for the inter-survey period, i.e., 1977-1987; removals and mortality are similarly calculated. Softwood growing-stock annual growth decreased 30 percent, from 120.1 million cubic feet in the 1977 survey to 83.9 million cubic feet in the current survey. Hardwood growing-stock annual growth, however, increased 33 percent.

Annual removals of growing stock increased 25 percent, compared to the 1977 estimates. Softwood removals increased 17 percent and now exceed growth by a small margin. Hardwood removals also increased, from 26.3 million cubic feet for the 1967-1977 period to 38.7 million cubic feet for the 1977-1987 period.

Annual mortality has increased since the previous survey due to changes for softwoods. Softwood mortality is estimated at 19.4 million cubic feet, up from 11.4 million cubic feet in 1977. Hardwood mortality is 12.8 million cubic feet annually, about the same as in the previous survey.

Tables 1-25 were developed to provide compatibility among Forest Inventory and Analysis Projects. Tables 26-36 are supplementary tables and may change from unit to unit or state to state to address specific resource issues.

DEFINITION OF TERMS

Average net annual growth.—Average net annual volume increase for the inter-survey period.

Average annual mortality.—Average annual sound-wood volume of growing-stock trees dying from natural causes.

Average annual removals.—Average net annual volume of growing-stock trees removed from the inventory by harvesting, cultural operations (such as timber-stand improvement), land clearing, or changes in land use.

Forest type.—A classification of forest land based upon the species forming a plurality of live-tree stocking.

Growing-stock trees.—Live trees of commercial species. Rough and rotten trees are excluded.

Growing-stock volume.—The cubic-foot volume of sound wood in growing-stock trees at least 5.0 inches in diameter at breast height, from a 1-foot stump to a minimum 4.0-inch top diameter outside bark of the central stem, or to the point where the central stem breaks into limbs.

Noncommercial species.—Tree species of typically small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products.

Poletimber trees.—Growing-stock trees of commercial species at least 5.0 inches in diameter at breast height, but smaller than sawtimber size.

Rotten trees.—Live trees of commercial species that do not contain at least one 12-foot saw log, now or prospectively, primarily because of rot.

Reserved timberland.—Productive public forest land withdrawn from timber utilization through statute or administrative regulations.

Rough trees.—Live trees of commercial species that do not contain at least one 12-foot saw log, now or prospectively, primarily because of roughness or poor form. Also included are all live trees of noncommercial species.

Sawtimber trees.—Live trees that are of commercial species, contain at least a 12-foot saw log, and meet regional specifications for freedom from defect. Softwoods must be at least 9.0 inches in diameter at breast height and hardwoods at least 11.0 inches in diameter at breast height.

Sawtimber volume.—Sound-wood volume of the saw-log portion of live sawtimber trees in board feet, International 1/4-inch rule and in cubic feet.

Site class.—A classification of forest land in terms of inherent capacity to grow crops of industrial wood.

Stand-size class.—A classification of forest land based on the size class of growing-stock trees on the sampled area; that is, sawtimber, poletimber, or sapling and seedling.

Timberland.—Forest land that is producing, or is capable of producing, crops of industrial wood and not withdrawn from timber utilization. Timberland is synonymous with "commercial forest land" in prior reports.

Tree grade.—A classification of the volume of the saw-log portion of sawtimber trees, based on the log grade of the butt log.

Woodland.—Forest land incapable of yielding crops of industrial wood because of adverse site conditions.

Core Tables 1-25

Table 1—Area by county and land class, Southwest Mississippi, 1987

County	All land ¹	Forest land			Reserved timberland	Nonforest land
		Total	Timberland ²	Woodland ³		
----- <i>Thousand acres</i> -----						
Adams	291.9	194.5	194.5	...	...	97.4
Amite	468.4	331.8	331.8	...	...	136.6
Claiborne	315.9	215.9	215.9	...	...	100.1
Copiah	498.5	348.2	348.2	...	...	150.3
Franklin	362.5	309.5	309.5	...	...	53.0
Hinds	559.8	206.8	206.8	...	...	352.9
Jefferson	334.8	239.7	239.7	...	...	95.1
Lincoln	375.4	259.4	259.4	...	...	116.0
Madison	459.2	181.9	181.9	...	...	277.4
Pike	262.5	154.2	154.2	...	...	108.4
Wilkinson	434.2	324.1	324.1	...	...	110.1
All counties	4363.3	2766.0	2766.0	...	...	1597.3

¹ From U.S. Bureau of the Census.

² Forest land (formerly termed commercial forest land) that is producing or capable of producing at least 20 cubic feet of industrial wood per acre per year. Includes areas which may be inaccessible or inoperable by current standards. Excludes reserved timberlands.

³ Forest land incapable of producing 20 cubic feet of industrial wood per acre per year under natural conditions because of adverse site conditions.

Table 2—Area of timberland by county and ownership class, Southwest Mississippi, 1987

County	All ownerships	National forest	Misc. federal	State	County and municipal	Forest industry ¹	Farmer	Corporate ²	Individual ²
----- Thousand acres -----									
Adams	194.5	15.0	...	15.0	...	10.0	49.9	15.0	89.8
Amite	331.8	21.8	...	38.1	...	32.6	103.4	5.4	130.6
Claiborne	215.9	...	5.8	5.8	...	52.5	40.8	17.5	93.3
Copiah	348.2	9.7	...	9.7	...	82.2	120.9	19.3	106.4
Franklin	309.5	94.8	...	6.3	6.3	63.2	69.5	19.0	50.5
Hinds	206.8	...	6.1	...	...	6.1	85.2	24.3	85.2
Jefferson	239.7	5.8	...	5.8	...	76.0	64.3	...	87.7
Lincoln	259.4	11.8	...	...	...	11.8	76.6	11.8	147.4
Madison	181.9	...	...	...	14.7	29.5	63.9	9.8	63.9
Pike	154.2	...	...	...	...	7.0	91.1	...	56.1
Wilkinson	324.1	28.2	...	7.0	...	119.8	70.5	7.0	91.6
All counties	2766.0	187.0	11.9	87.8	21.1	490.7	836.0	129.2	1002.4

¹ Includes land leased to forest industry.

² Indian land will be classed as corporate or individual as defined by the Bureau of Indian Affairs.

Table 3—Area of timberland by county and forest type group, Southwest Mississippi, 1987

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress	Elm-ash- Cottonwood
		Planted	Natural				
----- Thousand acres -----							
Adams	194.5	...	5.0	15.0	134.7	19.9	19.9
Amite	331.8	...	146.9	59.8	103.4	21.8	...
Claiborne	215.9	5.8	...	11.7	140.0	58.3	...
Copiah	348.2	38.7	58.0	77.4	120.9	53.2	...
Franklin	309.5	...	157.9	75.8	63.2	12.6	...
Hinds	206.8	18.3	24.3	30.4	103.4	30.4	...
Jefferson	239.7	23.4	23.4	17.5	134.5	35.1	5.8
Lincoln	259.4	17.7	82.5	59.0	82.5	17.7	...
Madison	181.9	9.8	29.5	44.2	44.2	54.1	...
Pike	154.2	...	49.1	35.0	63.1	7.0	...
Wilkinson	324.1	28.2	49.3	91.6	98.6	49.3	7.0
All counties	2766.0	141.9	625.9	517.4	1088.5	359.5	32.8

Table 4—Area of timberland by county and stand-size class, Southwest Mississippi, 1987

County	All classes	Stand-size class		Nonstocked ¹ areas	
		Sawtimber	Poletimber		Sapling- seedling
----- <i>Thousand acres</i> -----					
Adams	194.5	124.7	39.9	29.9	...
Amite	331.8	223.0	54.4	54.4	...
Claiborne	215.9	145.8	29.2	35.0	5.8
Copiah	348.2	174.1	87.1	87.1	...
Franklin	309.5	252.7	25.3	31.6	...
Hinds	206.8	139.9	36.5	30.4	...
Jefferson	239.7	122.8	58.5	58.5	...
Lincoln	259.4	117.9	64.9	76.6	...
Madison	181.9	88.5	34.4	59.0	...
Pike	154.2	98.1	28.0	28.0	...
Wilkinson	324.1	190.2	49.3	70.5	14.1
All counties	2766.0	1677.8	507.4	561.0	19.9

¹ Timberland less than 16.7 percent stocked.

Table 5—*Area of timberland by county and site class, Southwest Mississippi, 1987*

County	All classes	Site class (cubic feet/acre/year)				
		>165	120-165	85-120	50-85	<50
----- <i>Thousand acres</i> -----						
Adams	194.5	49.9	94.8	44.9	5.0	...
Amite	331.8	108.8	163.2	38.1	21.8	...
Claiborne	215.9	110.8	29.2	46.7	29.2	...
Copiah	348.2	38.7	101.6	183.8	24.2	...
Franklin	309.5	107.4	139.0	44.2	19.0	...
Hinds	206.8	79.1	73.0	42.6	12.2	...
Jefferson	239.7	70.2	87.7	70.2	11.7	...
Lincoln	259.4	41.3	100.2	70.7	47.2	...
Madison	181.9	39.3	29.5	88.5	24.6	...
Pike	154.2	56.1	49.1	49.1	...	...
Wilkinson	324.1	56.4	98.6	155.0	14.1	...
All counties	2766.0	757.8	965.8	833.7	208.7	...

Table 6—*Area of timberland by county and stocking classes of growing-stock trees, Southwest Mississippi, 1987*

County	All classes	Stocking class (percent)				
		>130	100-130	60-100	16.7-60	<16.7
----- <i>Thousand acres</i> -----						
Adams	194.5	...	10.0	99.7	84.8	...
Amite	331.8	...	92.5	185.0	54.4	...
Claiborne	215.9	5.8	11.7	128.3	64.2	5.8
Copiah	348.2	4.8	53.2	212.8	77.4	...
Franklin	309.5	...	113.7	157.9	37.9	...
Hinds	206.8	...	24.3	146.0	36.5	...
Jefferson	239.7	5.8	23.4	116.9	93.5	...
Lincoln	259.4	...	41.3	176.9	41.3	...
Madison	181.9	9.8	39.3	113.0	19.7	...
Pike	154.2	7.0	21.0	49.1	77.1	...
Wilkinson	324.1	7.0	42.3	162.1	98.6	14.1
All counties	2766.0	40.4	472.6	1547.7	685.3	19.9

**Table 7—Area of timberland by forest type and ownership class,
Southwest Mississippi, 1987**

Forest type ¹	All ownerships	National forest	Other public	Forest industry	Forest industry- leased	Other private
----- Thousand acres -----						
Loblolly-shortleaf pine	767.8	97.5	43.8	162.5	...	464.0
Softwood total	767.8	97.5	43.8	162.5	...	464.0
Oak-pine	517.4	55.8	21.1	88.5	...	352.1
Oak-hickory	1088.5	27.7	41.1	180.4	...	839.2
Oak-gum-cypress	359.5	5.9	9.8	59.3	...	284.5
Elm-ash-cottonwood	32.8	...	5.0	...	...	27.9
Hardwood total	1998.2	89.5	76.9	328.1	...	1503.7
All types	2766.0	187.0	120.7	490.7	...	1967.7

¹ Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

**Table 8—Area of timberland by ownership and stocking classes of growing-stock
trees, Southwest Mississippi, 1987**

Ownership class	All classes	Stocking class (percent)				
		>130	100-130	60-100	16.7-60	<16.7
----- <i>Thousand acres</i> -----						
National forest	187.0	7.0	73.4	95.3	11.2	...
Other public	120.7	...	38.0	70.7	12.0	...
Forest industry	490.7	21.4	87.0	233.9	128.4	19.9
Other private	1967.7	11.9	274.2	1147.8	533.8	...
All ownerships	2766.0	40.4	472.6	1547.7	685.3	19.9

**Table 9—Area of timberland by forest type and stand-size class,
Southwest Mississippi, 1987**

Forest type ¹	All classes	Stand-size class			Nonstocked ² areas
		Sawtimber	Poletimber	Sapling- seedling	
		----- <i>Thousand acres</i> -----			
Loblolly-shortleaf pine	767.8	505.9	73.8	188.1	...
Softwood total	767.8	505.9	73.8	188.1	...
Oak-pine	517.4	328.4	78.6	110.5	...
Oak-hickory	1088.5	573.1	273.7	234.7	7.0
Oak-gum-cypress	359.5	247.5	76.3	22.7	12.9
Elm-ash-cottonwood	32.8	22.9	5.0	5.0	...
Hardwood total	1998.2	1171.9	433.6	372.8	19.9
All types	2766.0	1677.8	507.4	561.0	19.9

¹ Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

² Timberland less than 16.7 percent stocked.

Table 10—Number of live trees on timberland by species and diameter class, Southwest Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----													
Longleaf-slash pines	922	...	...	...	316	44	199	155	110	42	40	15	...
Shortleaf-loblolly pine	290464	126533	65858	30638	19939	14564	10900	9099	5349	3575	2140	1817	50
Other yellow pines	2850	984	541	148	375	143	213	146	108	93	58	41	...
Cypress	1098	536	...	87	227	44	93	22	14	13	17	45	...
Other softwoods	7314	5017	451	654	569	180	132	185	48	57	21	...	...
Total softwoods	302647	133071	66850	31527	21426	14976	11536	9606	5630	3781	2277	1919	50
Select white oaks	46610	18560	12705	5594	3056	2298	1395	1124	607	474	321	429	47
Select red oaks	24364	8929	4988	2894	1812	1238	1083	848	876	511	398	643	143
Other white oaks	18315	6525	4445	2897	1667	1266	436	566	196	105	77	115	19
Other red oaks	136323	75103	22412	12730	7480	6338	3715	2907	2151	1253	882	1086	266
Hickory	58888	38818	9703	4203	1954	1063	1213	624	621	189	238	232	30
Hard maple	2802	2339	...	192	118	42	...	68	19	...	24	...	...
Soft maple	66108	45950	12662	4155	1860	670	444	247	86	10	8	16	...
Beech	11191	5047	2758	775	573	421	225	398	331	202	125	284	53
Sweetgum	312933	195485	61383	27133	13177	7158	3499	2326	1337	702	396	325	12
Tupelo-blackgum	67340	52324	5895	3939	2098	1007	1046	412	366	116	52	82	3
Ash	27104	19156	1550	2735	1581	545	581	387	231	201	107	27	3
Cottonwood-aspen	1684	...	993	...	70	29	57	45	115	116	81	132	46
Basswood	2058	1491	...	...	280	43	30	107	16	24	31	36	...
Yellow-poplar	18532	11578	2648	730	875	464	614	366	561	274	128	277	18
Black walnut	689	...	536	...	75	78	...	...	...	...	...	...	...
Other hardwoods	343032	234746	66583	21097	8884	5199	2322	2017	982	533	393	246	32
Total hardwoods	1137974	716052	209260	89073	45559	27859	16659	12442	8495	4710	3262	3930	673
Noncommercial	227542	171415	35679	13361	4850	1588	477	121	32	12	...	8	...
All species	1668163	1020538	311789	133960	71835	44423	28672	22169	14156	8502	5538	5857	723

Table 11—Number of growing-stock trees on timberland by species and diameter class, Southwest Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----													
Longleaf-slash pines	881	...	...	...	316	44	168	155	110	42	29	15	...
Shortleaf-loblolly pine	240410	93585	53595	28155	19309	14028	10410	8884	5153	3457	2061	1732	41
Other yellow pines	1647	541	...	...	375	92	213	126	108	93	58	41	...
Cypress	553	...	...	87	227	44	93	22	14	13	17	36	...
Other softwoods	5916	4031	451	471	525	110	132	93	48	43	12	...	...
Total softwoods	249406	98157	54045	28712	20752	14318	11016	9280	5433	3648	2178	1825	41
Select white oaks	27006	5489	8409	4685	2635	2076	1159	1086	520	373	239	327	8
Select red oaks	15087	2574	3552	2188	1645	1139	966	790	790	467	347	550	77
Other white oaks	10284	1525	2370	2614	1490	1113	345	432	167	68	57	98	4
Other red oaks	67425	25089	10471	10125	6359	5696	2859	2424	1779	1047	703	743	129
Hickory	25665	11785	5038	3610	1641	946	1072	492	504	180	199	175	23
Hard maple	931	646	...	90	73	42	...	68	...	...	11	...	...
Soft maple	16507	6526	5311	2785	1084	327	285	158	31	...	...	...	...
Beech	5320	2758	...	660	511	350	145	277	281	116	84	122	16
Sweetgum	150497	75501	28773	21670	11537	6181	2748	1931	1103	536	293	223	...
Tupelo-blackgum	20863	11520	2383	2860	1726	777	867	272	326	56	26	50	...
Ash	10245	3610	1550	2103	1206	545	428	326	188	162	96	27	3
Cottonwood-aspen	1128	...	457	...	70	29	57	45	115	116	81	112	46
Basswood	498	...	...	...	280	43	...	85	16	24	21	30	...
Yellow-poplar	13334	7331	2149	730	757	415	550	347	448	263	120	214	11
Black walnut	614	...	536	...	...	78	...	...	...	...	...	...	...
Other hardwoods	92581	39877	26067	12704	5672	3773	1512	1490	702	398	252	126	8
Total hardwoods	457984	194230	97066	66824	36687	23531	12993	10226	6968	3805	2529	2798	325
All species	707390	292386	151112	95535	57440	37849	24010	19507	12401	7454	4707	4623	367

Table 12—*Volume of growing stock on timberland by species and diameter class, Southwest Mississippi, 1987*

Species	Diameter class (inches at breast height)										
	All classes	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million cubic feet -----											
Longleaf-slash pines	23.0	...	2.0	0.5	3.9	5.4	4.8	2.5	2.2	1.7	...
Shortleaf-loblolly pine	1698.2	77.4	136.8	192.6	229.6	287.3	229.1	198.8	153.3	184.7	8.5
Other yellow pines	30.3	...	2.5	1.0	4.7	3.8	4.6	5.9	3.5	4.3	...
Cypress	9.6	0.2	1.2	0.3	1.5	0.6	0.6	0.7	1.5	3.0	...
Other softwoods	11.9	0.9	2.5	0.9	2.1	1.8	1.5	1.7	0.5	...	...
Total softwoods	1773.0	78.5	145.0	195.3	241.7	298.9	240.6	209.6	161.1	193.8	8.5
Select white oaks	184.4	12.5	16.8	25.4	22.0	29.5	20.5	17.7	13.3	25.5	1.2
Select red oaks	202.9	6.3	10.3	12.6	18.5	21.5	29.6	23.5	20.6	48.7	11.2
Other white oaks	57.0	5.3	7.7	11.1	5.5	9.7	4.2	3.0	2.3	7.8	0.4
Other red oaks	466.7	28.8	39.4	63.6	51.2	60.6	59.9	46.0	39.5	57.8	19.8
Hickory	116.4	8.7	9.8	9.3	19.1	13.3	16.9	8.9	11.8	15.2	3.4
Hard maple	3.2	0.4	0.4	0.4	...	1.5	...	...	0.6	...	...
Soft maple	25.8	6.8	6.0	3.4	4.7	4.0	0.8	...	...	...	...
Beech	49.0	1.9	2.7	3.8	2.4	7.6	9.8	5.1	4.9	8.8	2.1
Sweetgum	410.4	50.0	69.3	70.6	53.5	54.2	44.0	27.9	20.0	20.8	...
Tupelo-blackgum	63.4	6.3	9.3	8.3	14.7	6.6	10.6	2.1	1.5	4.1	...
Ash	57.6	5.1	7.6	6.6	7.9	8.6	6.9	7.0	5.5	2.0	0.4
Cottonwood-aspen	43.7	...	0.7	0.6	1.2	1.3	5.1	6.2	5.7	12.0	10.8
Basswood	10.2	...	1.6	0.5	...	2.6	0.6	1.2	1.1	2.6	...
Yellow-poplar	100.7	1.7	5.3	6.4	11.6	11.2	19.1	14.2	8.3	21.0	1.8
Black walnut	1.0	...	...	1.0	...	...	...	...	...	...	...
Other hardwoods	241.8	32.6	33.4	42.6	25.8	38.6	25.5	18.3	13.9	10.1	1.0
Total hardwoods	2034.0	166.3	220.3	266.1	238.2	270.8	253.6	181.1	148.9	236.4	52.3
All species	3807.1	244.8	365.3	461.5	479.9	569.7	494.2	390.7	310.0	430.2	60.8

Table 13—*Volume of growing stock in the saw-log portion of sawtimber¹ trees on timberland by species and diameter class, Southwest Mississippi, 1987*

Species	All classes	Diameter class (inches at breast height)							
		9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million cubic feet -----									
Longleaf-slash pines	19.8	0.5	3.5	5.1	4.6	2.4	2.0	1.7	...
Shortleaf-loblolly pine	1349.0	154.4	206.9	266.5	214.2	184.6	142.8	171.4	8.1
Other yellow pines	25.9	0.5	4.3	3.6	4.3	5.7	3.4	4.0	...
Cypress	6.9	0.3	1.0	0.5	0.5	0.6	1.4	2.6	...
Other softwoods	7.4	0.7	1.7	1.6	1.5	1.4	0.5	...	...
Total softwoods	1409.0	156.3	217.5	277.3	225.2	194.7	150.1	179.7	8.1
Select white oaks	109.6	...	16.7	24.6	17.8	15.5	11.7	22.0	1.2
Select red oaks	151.3	...	13.6	18.7	26.0	20.8	18.5	43.4	10.3
Other white oaks	28.6	...	4.4	8.3	3.7	2.7	2.1	7.0	0.4
Other red oaks	287.2	...	37.8	51.5	52.1	41.1	34.7	51.7	18.3
Hickory	73.9	...	14.2	11.0	14.2	8.0	10.4	13.3	2.9
Hard maple	1.6	...	...	1.1	...	...	0.5	...	...
Soft maple	7.1	...	3.4	3.1	0.6	...	...	...	...
Beech	35.5	...	1.7	6.6	8.4	4.0	4.3	8.4	2.1
Sweetgum	182.3	...	36.9	44.4	38.8	24.9	18.8	18.6	...
Tupelo-blackgum	31.5	...	10.0	5.0	9.6	2.0	1.1	3.8	...
Ash	31.8	...	6.0	6.9	6.0	5.9	5.0	1.7	0.4
Cottonwood-aspen	38.4	...	0.9	1.1	4.6	5.6	5.0	11.1	10.1
Basswood	7.3	...	...	2.2	0.5	1.2	1.0	2.4	...
Yellow-poplar	76.4	...	8.5	9.3	16.9	12.9	7.9	19.0	1.8
Other hardwoods	111.1	...	18.9	31.4	22.6	16.2	12.1	9.0	0.9
Total hardwoods	1173.5	...	173.1	225.2	221.8	160.6	133.1	211.4	48.3
All species	2582.5	156.3	390.6	502.5	447.0	355.4	283.2	391.1	56.4

¹ That part of the bole of sawtimber trees between a 1-foot stump and saw-log top, including the portion of the forks large enough to contain a saw log.

Table 14—Volume of sawtimber on timberland by species and diameter class, Southwest Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)							
		9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Million board feet-----									
Longleaf-slash pines	126.4	2.7	21.3	32.3	29.6	15.2	13.9	11.4	...
Shortleaf-loblolly pine	8590.1	855.3	1252.3	1690.7	1390.9	1209.3	959.2	1176.1	56.2
Other yellow pines	164.0	2.5	25.8	21.2	26.8	39.1	21.9	26.8	...
Cypress	41.1	1.1	4.6	3.2	3.4	3.5	9.4	16.0	...
Other softwoods	41.8	3.6	9.8	9.0	8.4	8.5	2.6	...	...
Total softwoods	8963.4	865.2	1313.9	1756.4	1459.1	1275.6	1006.9	1230.2	56.2
Select white oaks	692.4	...	95.4	147.9	111.6	100.0	77.5	151.6	8.4
Select red oaks	954.0	...	75.9	109.9	159.2	133.0	120.6	288.5	66.9
Other white oaks	174.8	...	24.5	47.1	21.7	17.4	13.2	48.0	2.9
Other red oaks	1753.7	...	210.2	296.4	312.5	257.7	218.5	338.0	120.3
Hickory	463.1	...	79.8	64.3	89.8	50.3	68.9	89.0	20.9
Hard maple	10.2	...	...	6.9	...	...	3.2	...	...
Soft maple	43.3	...	19.9	19.8	3.6	...	...	...	...
Beech	225.8	...	9.8	40.3	53.6	26.7	28.2	55.8	11.4
Sweetgum	1097.4	...	206.2	262.2	237.2	152.0	120.2	119.6	...
Tupelo-blackgum	178.5	...	52.5	27.5	55.9	11.3	7.3	24.1	...
Ash	193.3	...	34.7	40.5	38.2	36.9	30.1	11.1	1.8
Cottonwood-aspen	250.5	...	5.5	6.8	29.9	34.1	32.8	73.8	67.5
Basswood	47.6	...	...	13.7	3.2	8.1	6.4	16.4	...
Yellow-poplar	476.6	...	49.0	58.5	104.0	81.8	48.5	123.9	10.8
Other hardwoods	672.2	...	108.1	186.9	138.1	101.9	75.4	56.8	5.0
Total hardwoods	7233.4	...	971.6	1328.7	1358.6	1011.1	850.8	1396.5	316.1
All species	16196.7	865.2	2285.5	3085.1	2817.6	2286.7	1857.7	2626.7	372.2

Table 15—Volume of growing stock and sawtimber on timberland by county and species group, Southwest Mississippi, 1987

County	Growing stock						Sawtimber					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine			Soft ¹	Hard ²		Pine			Soft ¹	Hard ²
		Planted	Natural	Other				Planted	Natural	Other		
		-----Million cubic feet-----						-----Million board feet-----				
Adams	259.9	...	44.5	0.7	128.2	86.5	1060.5	...	256.0	3.8	446.2	354.4
Amite	523.7	...	343.6	...	48.3	131.8	2271.1	...	1668.5	...	100.4	502.2
Claiborne	324.2	15.6	20.2	1.1	145.5	141.8	1410.2	95.4	114.4	3.3	564.4	632.8
Copiah	437.6	34.0	176.6	4.4	83.2	139.3	1797.4	139.2	859.9	16.7	254.4	527.1
Franklin	648.9	...	466.0	...	65.8	117.1	3240.2	...	2657.2	...	162.5	420.5
Hinds	287.2	8.0	70.7	2.8	75.0	130.7	1145.8	25.9	342.2	13.5	226.9	537.2
Jefferson	274.9	13.1	74.0	1.5	80.5	105.8	1086.1	67.1	387.4	3.8	250.4	377.5
Lincoln	277.6	6.1	139.6	...	61.1	70.7	1016.5	10.7	597.4	...	169.8	238.5
Madison	200.0	2.2	64.5	6.1	39.9	87.3	710.8	7.4	271.6	20.5	114.3	297.1
Pike	188.5	...	105.0	...	38.0	45.5	775.9	...	474.2	...	125.7	176.0
Wilkinson	384.6	3.9	163.9	4.9	100.8	111.2	1682.3	4.8	901.2	21.3	324.7	430.3
All counties	3807.1	82.9	1668.6	21.5	866.4	1167.7	16196.7	350.4	8530.1	82.9	2739.6	4493.8

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

**Table 16—Volume of timber on timberland by class of timber and species group,
Southwest Mississippi, 1987**

Class of timber	All species	Softwood			Hardwood	
		Pine			Soft ¹	Hard ²
		Planted	Natural	Other		
----- <i>Million cubic feet</i> -----						
Sawtimber trees:						
Saw-log portion	2582.5	55.5	1339.2	14.3	449.5	724.1
Upper-stem portion	348.3	4.8	133.3	2.4	85.3	122.5
Total	2930.8	60.3	1472.5	16.7	534.8	846.5
Poletimber trees	876.2	22.6	196.2	4.8	331.6	321.1
All growing-stock trees	3807.1	82.9	1668.6	21.5	866.4	1167.7
Rough trees:						
Sawtimber size	278.0	2.9	40.3	2.5	81.2	151.1
Poletimber size	188.1	1.6	8.6	0.7	62.5	114.9
Total	466.1	4.5	48.9	3.1	143.7	265.9
Rotten trees:						
Sawtimber size	53.5	...	1.9	0.2	19.9	31.6
Poletimber size	4.1	...	...	...	2.5	1.6
Total	57.6	...	1.9	0.2	22.3	33.2
Salvable dead trees:						
Sawtimber size	14.7	...	10.2	...	3.2	1.2
Poletimber size	16.9	...	8.1	...	2.5	6.2
Total	31.5	...	18.3	...	5.8	7.4
All classes	4362.3	87.3	1737.8	24.8	1038.1	1474.3

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 17—Volume of live trees and growing stock on timberland by ownership class and species group, Southwest Mississippi, 1987

Ownership class	Live trees						Growing stock					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
-----Million cubic feet-----												
National forest	465.3	...	317.8	...	50.2	97.3	441.2	...	314.5	...	44.9	81.8
Other public	309.3	15.4	112.6	4.1	79.2	98.0	270.7	14.2	107.7	3.7	66.3	78.8
Forest industry	633.8	22.4	271.1	1.6	130.0	208.7	557.2	20.5	265.6	1.3	108.8	161.1
Other private	2922.4	49.5	1018.0	19.2	773.0	1062.8	2538.0	48.1	980.9	16.5	646.4	846.1
All ownerships	4330.8	87.3	1719.5	24.8	1032.4	1466.8	3807.1	82.9	1668.6	21.5	866.4	1167.7

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 18—Average net annual growth of growing stock and sawtimber on timberland by county and species group, Southwest Mississippi, 1987

County	Growing stock						Sawtimber							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard ²
-----Million cubic feet-----						-----Million board feet-----								
Adams	14.1	...	2.1	...	6.9	5.1	63.2	...	16.1	0.2	27.9	19.0		
Amite	20.6	0.7	14.7	...	0.9	4.3	115.6	1.9	91.7	...	2.6	19.5		
Claiborne	16.1	0.9	1.8	0.1	6.3	6.9	87.5	7.7	14.0	0.2	30.0	35.5		
Copiah	24.9	1.4	12.4	0.3	4.2	6.6	110.9	3.3	65.8	0.4	13.7	27.7		
Franklin	20.7	...	13.0	...	3.3	4.4	116.6	...	88.2	...	7.6	20.8		
Hinds	12.2	0.5	2.3	...	3.0	6.3	60.9	1.7	16.4	0.5	12.2	30.2		
Jefferson	13.9	...	4.2	0.1	4.1	5.4	66.1	0.2	29.2	0.2	14.4	22.2		
Lincoln	14.5	0.5	8.6	...	2.4	3.0	70.0	3.1	44.5	-0.2	9.2	13.3		
Madison	10.6	-0.1	5.4	0.1	0.6	4.6	42.9	0.6	22.9	0.1	1.6	17.7		
Pike	10.4	...	6.9	...	1.0	2.5	55.0	...	38.5	...	7.2	9.3		
Wilkinson	18.4	...	7.5	0.3	5.5	5.1	99.4	...	51.5	1.5	20.7	25.7		
All counties	176.3	3.9	79.1	0.9	38.3	54.1	888.0	18.4	478.8	2.9	147.0	240.9		

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 19—Average annual removals of growing stock and sawtimber on timberland by county and species group, Southwest Mississippi, 1987

County	Growing stock						Sawtimber							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard ²
-----Million cubic feet-----														
Adams	8.7	...	2.0	...	3.7	2.9	34.0	...	11.2	...	14.0	8.8		
Amite	16.9	...	14.7	...	0.6	1.6	79.8	...	70.7	...	2.6	6.5		
Claiborne	8.7	1.4	5.1	...	1.7	0.5	41.6	6.0	26.4	...	6.8	2.4		
Copiah	18.8	0.3	13.0	0.3	2.0	3.2	79.4	0.9	58.5	0.5	5.4	14.1		
Franklin	18.7	...	15.8	...	1.6	1.3	94.9	...	85.7	...	3.9	5.4		
Hinds	5.4	0.5	1.9	...	0.3	2.7	26.1	2.6	9.0	...	1.2	13.3		
Jefferson	10.1	0.2	6.5	...	1.5	1.9	48.7	0.5	37.0	...	3.7	7.5		
Lincoln	7.7	...	6.2	...	0.4	1.1	34.1	...	28.7	...	1.8	3.6		
Madison	8.5	0.6	5.0	...	0.6	2.3	30.8	1.8	17.6	...	2.3	9.1		
Pike	5.9	...	4.0	...	0.6	1.3	23.7	...	17.0	...	1.8	4.9		
Wilkinson	16.9	...	9.7	0.4	3.8	3.0	81.9	...	53.5	1.5	13.2	13.7		
All counties	126.4	3.0	84.0	0.7	16.9	21.9	575.2	11.9	415.3	2.0	56.8	89.2		

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottownwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 20—Average net annual growth and average annual removals of growing stock on timberland by species, Southwest Mississippi, 1987

Species	Growth	Removals
----- Million cubic feet -----		
Yellow pines	82.9	87.0
Other softwoods	0.9	0.7
Total softwoods	83.9	87.6
Select white-red oaks	18.6	6.2
Other white-red oaks	24.2	10.8
Hickory	4.9	2.2
Hard maple	0.1	...
Sweetgum	16.7	7.5
Ash-walnut-black cherry	4.7	1.6
Yellow-poplar	6.0	2.3
Other hardwoods	17.2	8.0
Total hardwoods	92.4	38.7
All species	176.3	126.4

Table 21—Average net annual growth and average annual removals of sawtimber on timberland by species, Southwest Mississippi, 1987

Species	Growth	Removals
- - - - Million board feet - - - -		
Yellow pines	497.2	427.2
Other softwoods	2.9	2.0
Total softwoods	500.1	429.2
Select white-red oaks	89.7	26.2
Other white-red oaks	104.7	46.2
Hickory	21.6	8.6
Hard maple	0.4	...
Sweetgum	51.7	16.9
Ash-walnut-black cherry	15.5	4.6
Yellow-poplar	32.2	11.8
Other hardwoods	72.2	31.6
Total hardwoods	387.9	146.0
All species	888.0	575.2

Table 22—Average annual mortality of growing stock and sawtimber on timberland by species, Southwest Mississippi, 1987

Species	Growing stock	Sawtimber
- - Million cubic feet - - Million board feet - -		
Yellow pines	19.4	73.6
Other softwoods	...	0.1
Total softwoods	19.4	73.7
Select white-red oaks	1.5	3.9
Other white-red oaks	3.2	7.8
Hickory	0.6	3.0
Sweetgum	3.5	8.5
Ash-walnut-black cherry	0.2	0.3
Yellow-poplar	0.4	1.9
Other hardwoods	3.4	8.2
Total hardwoods	12.8	33.7
All species	32.2	107.4

Table 23—Average net annual growth and average annual removals of growing stock on timberland by ownership class and species group, Southwest Mississippi, 1987

Ownership class	Growth						Removals					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
-----Million cubic feet-----												
National forest	11.8	...	6.7	...	2.6	2.4	13.2	...	12.2	0.1	0.4	0.5
Other public	8.3	...	4.0	...	2.1	2.3	1.5	...	0.4	...	...	1.1
Forest industry	31.6	0.8	17.5	0.1	5.2	7.9	31.1	0.2	21.0	0.4	5.3	4.3
Other private	124.5	3.1	50.9	0.8	28.4	41.5	80.6	2.9	50.4	0.2	11.1	16.0
All ownerships	176.3	3.9	79.1	0.9	38.3	54.1	126.4	3.0	84.0	0.7	16.9	21.9

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 24—Average net annual growth and average annual removals of sawtimber on timberland by ownership class and species, Southwest Mississippi, 1987

Ownership class	Growth						Removals					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
-----Million board feet-----												
National forest	64.9	...	46.9	0.1	6.4	11.6	73.0	...	69.7	0.3	1.8	1.2
Other public	49.3	...	26.7	...	10.5	12.0	3.9	...	1.2	...	...	2.7
Forest industry	165.4	3.2	100.4	0.6	23.1	38.0	140.2	0.5	104.1	1.5	14.4	19.7
Other private	608.5	15.1	304.8	2.2	107.0	179.3	358.1	11.4	240.3	0.3	40.6	65.6
All ownerships	888.0	18.4	478.8	2.9	147.0	240.9	575.2	11.9	415.3	2.0	56.8	89.2

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

**Table 25—Volume of sawtimber on timberland by species and tree grade,
Southwest Mississippi, 1987**

Species	All grades	Grade 1	Grade 2	Grade 3	Grade 4
----- Million board feet -----					
Yellow pines	8880.5	1516.2	1638.2	5726.1	...
Cypress	41.1	11.0	13.4	16.7	...
Redcedar	41.8	41.8	...	...	...
Total softwoods	8963.4	1569.0	1651.6	5742.8	...
Select white-red oaks	1646.3	185.3	441.8	687.2	332.1
Other white-red oaks	1928.6	22.9	229.9	782.7	893.0
Hickory	463.1	37.4	87.2	257.2	81.3
Hard maple	10.2	...	...	6.0	4.2
Sweetgum	1097.4	78.2	205.3	611.8	202.0
Tupelo and blackgum	178.5	9.0	55.1	102.3	12.1
Ash-walnut-black cherry	269.2	41.5	54.5	147.1	26.0
Yellow-poplar	476.6	40.9	119.8	244.5	71.5
Other hardwoods	1163.5	153.2	276.5	457.1	276.7
Total hardwoods	7233.4	568.3	1470.3	3295.7	1899.0
All species	16196.7	2137.3	3121.9	9038.5	1899.0

Supplemental Tables 26–36

**Table 26—Area of timberland by stand age, forest type group and type of regeneration,
Southwest Mississippi, 1987**

Stand age class	Pine		Oak-pine		Other hardwood types	
	Artificial	Natural	Artificial	Natural	Artificial	Natural
----- Thousand acres -----						
1-10	90.7	73.2	17.7	45.5	38.5	92.9
11-20	18.8	28.6	...	4.8	...	...
21-30	15.8	7.0	...	...	...	...
31-40	...	24.2	4.8	5.8	...	17.5
41-50	11.7	37.4	...	4.8	4.8	17.8
>50	...	...	...	6.1	...	6.1
Mixed	4.9	455.6	5.9	421.9	...	1303.2
Total	141.9	625.9	28.4	489.0	43.3	1437.4

Table 27—*Volume of softwood growing stock on timberland by forest type, Southwest Mississippi, 1987*

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress	Elm-ash- cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Adams	45.2	...	8.4	16.7	20.1	...	...
Amite	343.6	...	270.7	42.6	27.9	2.4	...
Claiborne	36.9	15.6	...	5.8	15.5	...	...
Copiah	215.0	27.7	89.0	62.0	23.1	13.2	...
Franklin	466.0	...	360.9	86.3	17.9	1.0	...
Hinds	81.5	8.0	39.8	15.2	17.4	1.3	...
Jefferson	88.6	12.4	36.4	18.3	19.8	1.7	...
Lincoln	145.7	1.2	71.3	53.1	16.3	3.8	...
Madison	72.8	2.2	38.2	26.5	3.0	2.8	...
Pike	105.0	...	65.3	32.7	7.1	...	...
Wilkinson	172.6	3.9	66.6	81.6	13.3	6.8	0.5
All counties	1773.0	71.0	1046.6	440.7	181.2	33.1	0.5

Table 28—*Volume of hardwood growing stock on timberland by forest type, Southwest Mississippi, 1987*

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypresss	Elm-ash- cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Adams	214.7	...	3.2	12.7	127.9	29.0	42.0
Amite	180.1	...	38.0	27.3	81.4	33.4	...
Claiborne	287.3	0.6	...	0.2	201.6	84.9	...
Copiah	222.6	3.3	11.3	46.3	82.0	79.7	...
Franklin	182.9	...	59.3	56.5	44.8	22.3	...
Hinds	205.7	0.6	15.3	19.8	110.0	59.9	...
Jefferson	186.4	1.2	5.9	12.9	114.1	36.9	15.3
Lincoln	131.9	...	11.4	33.7	59.7	27.0	...
Madison	127.2	...	3.1	20.3	29.2	74.5	...
Pike	83.5	...	3.7	46.7	28.9	4.3	...
Wilkinson	212.0	2.4	7.0	44.4	108.3	36.2	13.7
All counties	2034.0	8.1	158.1	320.9	987.8	488.2	71.0

Table 29—*Volume of softwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, Southwest Mississippi, 1987*

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress	Elm-ash- cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Adams	40.1	...	7.6	14.2	18.3	...	...
Amite	267.8	...	212.1	29.3	24.0	2.3	...
Claiborne	33.0	14.9	...	5.4	12.7	...	...
Copiah	163.5	15.8	70.0	48.3	19.9	9.5	...
Franklin	403.7	...	312.2	75.4	15.1	1.0	...
Hinds	61.1	4.3	31.5	12.5	11.7	1.1	...
Jefferson	72.2	10.2	28.2	17.0	15.6	1.2	...
Lincoln	100.3	...	43.2	41.6	11.9	3.7	...
Madison	49.8	1.2	25.4	18.7	2.2	2.2	...
Pike	74.0	...	42.6	26.6	4.8	...	...
Wilkinson	143.4	1.1	56.5	69.9	10.4	5.3	0.3
All counties	1409.0	47.5	829.2	358.9	146.7	26.4	0.3

Table 30—*Volume of hardwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, Southwest Mississippi, 1987*

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress	Elm-ash- cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Adams	126.8	...	2.4	6.0	74.4	15.7	28.3
Amite	99.7	...	19.5	11.3	48.3	20.7	...
Claiborne	191.7	...	...	...	140.4	51.3	...
Copiah	128.1	1.3	3.1	22.8	48.6	52.3	...
Franklin	94.5	...	22.5	35.5	18.6	17.9	...
Hinds	122.8	0.6	4.5	9.1	68.1	40.6	...
Jefferson	102.7	0.8	2.5	6.6	62.6	19.5	10.7
Lincoln	68.0	...	3.4	12.6	32.2	19.8	...
Madison	67.1	...	1.2	5.4	16.0	44.4	...
Pike	50.1	...	0.4	28.2	17.7	3.7	...
Wilkinson	122.0	1.9	1.9	18.0	63.3	25.1	11.8
All counties	1173.5	4.6	61.4	155.6	590.2	311.0	50.8

Table 31—*Volume of timber on timberland by county, class of timber and species group, Southwest Mississippi, 1987*

County	All classes	Growing stock		Rough		Rotten	
		Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
----- <i>Million cubic feet</i> -----							
Adams	305.3	45.2	214.7	0.5	37.4	0.7	6.7
Amite	581.9	343.6	180.1	9.9	40.8	...	7.4
Claiborne	393.6	36.9	287.3	3.8	60.0	...	5.6
Copiah	492.8	215.0	222.6	9.0	38.2	...	8.0
Franklin	701.5	466.0	182.9	8.6	34.3	1.2	8.5
Hinds	328.7	81.5	205.7	4.6	34.8	...	2.1
Jefferson	324.7	88.6	186.4	3.4	41.0	0.2	5.2
Lincoln	305.6	145.7	131.9	3.0	21.4	...	3.7
Madison	236.9	72.8	127.2	5.3	28.9	...	2.7
Pike	217.2	105.0	83.5	4.2	23.6	...	0.9
Wilkinson	442.7	172.6	212.0	4.2	49.1	...	4.7
All counties	4330.8	1773.0	2034.0	56.5	409.6	2.1	55.5

Table 32—Number of live trees on timberland by detailed species and diameter class, Southwest Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----													
Longleaf pine	564	...	...	...	147	44	103	114	89	30	29	7	...
Slash pine	358	...	...	...	169	...	96	41	21	12	11	9	...
Shortleaf pine	62471	26850	12339	6604	6531	4131	2891	1663	807	454	134	66	...
Loblolly pine	227993	99684	53519	24034	13408	10434	8008	7436	4542	3121	2006	1751	50
Spruce pine	2850	984	541	148	375	143	213	146	108	93	58	41	...
Redcedar	7314	5017	451	654	569	180	132	185	48	57	21	...	...
Cypress	1098	536	...	87	227	44	93	22	14	13	17	45	...
Total softwoods	302647	133071	66850	31527	21426	14976	11536	9606	5630	3781	2277	1919	50
Select white oaks	46610	18560	12705	5594	3056	2298	1395	1124	607	474	321	429	47
Select red oaks	24364	8929	4988	2894	1812	1238	1083	848	876	511	398	643	143
Other white oaks	18315	6525	4445	2897	1667	1266	436	566	196	105	77	115	19
Other red oaks	136323	75103	22412	12730	7480	6338	3715	2907	2151	1253	882	1086	266
Sweet pecan	3932	2794	...	509	176	99	79	55	69	32	45	49	24
Water hickory	353	...	...	98	136	49	25	...	18	...	9	13	4
Other hickories	54604	36024	9703	3595	1643	915	1109	569	534	156	183	170	2
Persimmon	20369	18383	1075	584	188	115	23	...	...	...	...	...	...
Hard maple	2802	2339	...	192	118	42	...	68	19	...	24	...	...
Soft maple	52157	37935	10219	2576	915	198	164	61	55	10	8	16	...
Boxelder	13951	8016	2443	1578	945	472	280	186	31	...	...	...	...
Beech	11191	5047	2758	775	573	421	225	398	331	202	125	284	53
Sweetgum	312933	195485	61383	27133	13177	7158	3499	2326	1337	702	396	325	12
Blackgum	58028	45832	5452	3402	1294	672	654	331	196	91	33	68	3
Other gums/tupelos	9312	6492	443	537	805	335	391	81	170	25	19	14	...
White ash	9121	6231	1015	850	332	229	112	114	96	66	64	10	...
Other ashes	17984	12925	535	1885	1249	316	469	272	135	135	43	17	3
Sycamore	6610	1801	978	1682	807	499	248	272	97	130	24	69	4
Cottonwood	1684	...	993	...	70	29	57	45	115	116	81	132	46
Basswood	2058	1491	...	...	280	43	30	107	16	24	31	36	...
Yellow-poplar	18532	11578	2648	730	875	464	614	366	561	274	128	277	18
Magnolia	10807	5909	3419	510	328	120	140	86	138	61	66	19	12
Sweetbay	6100	3860	1608	221	126	78	35	96	31	26	13	7	...
Willow	7829	3982	2522	687	99	268	72	79	32	33	37	15	4
Black walnut	689	...	536	...	75	78	...	...	...	...	...	...	...
Black cherry	33978	25316	4373	2073	834	675	229	279	108	52	40	...	...
American elm	15146	6636	4154	1632	1003	653	414	305	182	102	25	34	6
Other elms	79138	58384	14324	3534	1494	639	299	258	111	15	41	36	4
River birch	688	646	...	...	...	...	...	42	..	...	...	...	...
Hackberry	18368	6730	4346	2722	1885	1243	627	396	189	103	95	28	3
Black locust	7503	6773	...	268	177	270	...	...	15	...	...	...	...
Other locusts	1364	...	646	269	64	247	34	40	18	11	24	11	...
Sassafras	7071	4333	1973	215	273	129	...	83	15	...	29	21	...
Dogwood	112129	81287	24495	5594	585	86	66	...	15	...	...	...	...
Holly	7731	4961	1575	700	320	39	55	43	31	...	...	7	...
Other commercial	8202	5744	1093	405	700	140	80	40	...	...	...	...	...
Total hardwoods	1137974	716052	209260	89073	45559	27859	16659	12442	8495	4710	3262	3930	673
Noncommercial	227542	171415	35679	13361	4850	1588	477	121	32	12	...	8	...
All species	1668163	1020538	311789	133960	71835	44423	28672	22169	14156	8502	5538	5857	723

Table 33—*Number of growing-stock trees on timberland by detailed species and diameter class, Southwest Mississippi, 1987*

Species	Diameter class (inches at breast height)										
	All classes	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
-----Thousand trees-----											
Longleaf pine	553	...	147	44	103	114	89	30	18	7	...
Slash pine	328	...	169	...	65	41	21	12	11	9	...
Shortleaf pine	22622	6097	6531	4056	2867	1640	776	454	134	66	...
Loblolly pine	70607	22058	12778	9972	7543	7244	4377	3003	1927	1666	41
Spruce pine	1106	...	375	92	213	126	108	93	58	41	...
Redcedar	1435	471	525	110	132	93	48	43	12	...	...
Cypress	553	87	227	44	93	22	14	13	17	36	...
Total softwoods	97204	28712	20752	14318	11016	9280	5433	3648	2178	1825	41
Select white oaks	13109	4685	2635	2076	1159	1086	520	373	239	327	8
Select red oaks	8961	2188	1645	1139	966	790	790	467	347	550	77
Other white oaks	6389	2614	1490	1113	345	432	167	68	57	98	4
Other red oaks	31864	10125	6359	5696	2859	2424	1779	1047	703	743	129
Sweet pecan	843	404	126	99	56	...	55	32	28	24	20
Water hickory	353	98	136	49	25	...	18	...	9	13	4
Other hickories	7647	3108	1380	798	991	492	431	147	162	138	...
Persimmon	613	393	83	115	23	...	...	...	...	...	...
Hard maple	285	90	73	42	...	68	...	...	11	...	...
Soft maple	2769	1887	668	98	85	16	15	...	...	...	...
Boxelder	1901	898	416	229	200	143	16	...	...	...	...
Beech	2563	660	511	350	145	277	281	116	84	122	16
Sweetgum	46223	21670	11537	6181	2748	1931	1103	536	293	223	...
Blackgum	4718	2323	922	442	545	207	170	43	17	50	...
Other gums/tupelos	2242	537	805	335	322	65	156	14	9	...	...
White ash	1568	590	332	229	112	94	84	52	64	10	...
Other ashes	3517	1513	874	316	316	233	103	110	32	17	3
Sycamore	3310	1509	737	374	197	224	82	104	24	59	...
Cottonwood	671	...	70	29	57	45	115	116	81	112	46
Basswood	498	...	280	43	...	85	16	24	21	30	...
Yellow-poplar	3853	730	757	415	550	347	448	263	120	214	11
Magnolia	1262	510	328	120	55	63	89	51	33	10	4
Sweetbay	380	96	126	37	35	27	31	15	13	...	...
Willow	1074	554	99	190	72	60	32	33	26	8	...
Black walnut	78	...	...	78	...	...	...	...	...	...	...
Black cherry	3033	1500	554	506	113	197	108	25	31	...	...
American elm	2663	919	432	450	332	290	133	80	9	14	4
Other elms	4737	2205	1350	603	268	200	83	...	28	...	...
River birch	42	...	...	...	...	42	...	...	...	...	...
Hackberry	4670	1487	1370	905	363	299	96	78	57	14	...
Black locust	351	151	52	149	...	...	...	...	...	...	...
Other locusts	250	90	...	119	...	...	18	11	11	...	...
Sassafras	473	123	102	129	...	62	15	...	20	21	...
Dogwood	2612	2498	99	...	...	...	15	...	...	...	...
Holly	804	586	99	39	55	26	...	...	...	...	...
Other commercial	363	84	242	37	...	...	...	...	...	...	...
Total hardwoods	166688	66824	36687	23531	12993	10226	6968	3805	2529	2798	325
All species	263892	95535	57440	37849	24010	19507	12401	7454	4707	4623	367

Table 34—Volume of growing-stock trees on timberland by species and diameter class, Southwest Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)									
		5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Million cubic feet-----											
Longleaf pine	14.3	...	1.0	0.5	2.2	3.4	3.8	1.6	1.2	0.7	...
Slash pine	8.7	...	1.1	...	1.7	2.0	1.0	0.9	1.0	1.1	...
Shortleaf pine	344.8	20.3	54.0	62.4	66.7	57.8	37.5	27.6	11.0	7.5	...
Loblolly pine	1353.3	57.1	82.7	130.2	162.9	229.5	191.6	171.2	142.3	177.2	8.5
Spruce pine	30.3	...	2.5	1.0	4.7	3.8	4.6	5.9	3.5	4.3	...
Redcedar	11.9	0.9	2.5	0.9	2.1	1.8	1.5	1.7	0.5	...	...
Cypress	9.6	0.2	1.2	0.3	1.5	0.6	0.6	0.7	1.5	3.0	...
Total softwoods	1773.0	78.5	145.0	195.3	241.7	298.9	240.6	209.6	161.1	193.8	8.5
Select white oaks	184.4	12.5	16.8	25.4	22.0	29.5	20.5	17.7	13.3	25.5	1.2
Select red oaks	202.9	6.3	10.3	12.6	18.5	21.5	29.6	23.5	20.6	48.7	11.2
Other white oaks	57.0	5.3	7.7	11.1	5.5	9.7	4.2	3.0	2.3	7.8	0.4
Other red oaks	466.7	28.8	39.4	63.6	51.2	60.6	59.9	46.0	39.5	57.8	19.8
Sweet pecan	14.2	0.8	0.6	0.8	1.0	...	1.9	1.7	2.1	2.5	2.8
Water hickory	5.2	0.2	0.8	0.6	0.5	...	0.6	...	0.6	1.3	0.7
Other hickories	97.0	7.7	8.5	7.9	17.6	13.3	14.5	7.1	9.1	11.4	...
Persimmon	3.3	1.2	0.4	1.4	0.4	...	...	...	...	...	...
Hard maple	3.2	0.4	0.4	0.4	...	1.5	...	...	0.6	...	...
Soft maple	10.7	4.4	3.3	0.9	1.2	0.4	0.5	...	...	...	...
Boxelder	15.1	2.4	2.8	2.5	3.5	3.6	0.3	...	...	...	...
Beech	49.0	1.9	2.7	3.8	2.4	7.6	9.8	5.1	4.9	8.8	2.1
Sweetgum	410.4	50.0	69.3	70.6	53.5	54.2	44.0	27.9	20.0	20.8	...
Blackgum	42.7	4.8	5.2	4.8	9.4	5.4	6.4	1.6	1.1	4.1	...
Other gums/tupelos	20.7	1.5	4.1	3.4	5.3	1.2	4.3	0.5	0.4	...	...
White ash	21.6	1.4	2.0	2.6	2.6	2.9	3.2	2.5	3.6	0.9	...
Other ashes	36.0	3.6	5.6	4.0	5.3	5.7	3.7	4.5	2.0	1.2	0.4
Sycamore	42.8	6.0	5.4	5.0	3.5	7.2	3.3	5.2	1.9	5.3	...
Cottonwood	43.7	...	0.7	0.6	1.2	1.3	5.1	6.2	5.7	12.0	10.8
Basswood	10.2	...	1.6	0.5	...	2.6	0.6	1.2	1.1	2.6	...
Yellow-poplar	100.7	1.7	5.3	6.4	11.6	11.2	19.1	14.2	8.3	21.0	1.8
Magnolia	14.8	1.2	1.9	1.1	0.9	1.4	3.3	2.5	1.6	0.6	0.5
Sweetbay	5.8	0.4	1.0	0.5	0.6	0.8	1.5	0.6	0.6	...	...
Willow	11.1	1.3	0.2	2.1	1.2	1.4	1.2	1.4	1.7	0.6	...
Black walnut	1.0	...	...	1.0	...	...	...	...	...	...	...
Black cherry	27.3	3.8	3.1	5.8	2.1	5.2	4.4	1.4	1.5	...	...
American elm	34.0	2.3	2.2	5.2	6.2	7.7	5.0	3.3	0.5	1.1	0.5
Other elms	32.8	4.8	7.4	6.6	4.7	5.1	2.8	...	1.3	...	...
River birch	0.9	...	...	...	...	0.9	...	...	...	...	...
Hackberry	46.0	4.1	9.1	9.6	5.6	7.4	2.8	3.5	3.1	0.8	...
Black locust	2.8	0.7	0.4	1.6	...	...	...	...	...	...	...
Other locusts	3.4	0.5	...	1.3	...	...	0.5	0.5	0.6	...	...
Sassafras	6.7	0.1	0.7	1.6	...	1.1	0.5	...	1.1	1.7	...
Dogwood	5.5	4.9	0.3	...	...	...	0.3	...	...	...	...
Holly	3.0	1.0	0.3	0.4	0.8	0.5	...	...	...	...	...
Other commercial	1.6	0.4	0.9	0.3	...	...	...	...	...	...	...
Total hardwoods	2034.0	166.3	220.3	266.1	238.2	270.8	253.6	181.1	148.9	236.4	52.3
All species	3807.1	244.8	365.3	461.5	479.9	569.7	494.2	390.7	310.0	430.2	60.8

Table 35—Volume of growing stock in the saw-log portion of sawtimber trees on timberland by detailed species and diameter class, Southwest Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)							
		9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million cubic feet -----									
Longleaf pine	12.6	0.5	2.0	3.2	3.7	1.5	1.1	0.7	...
Slash pine	7.2	...	1.5	1.8	1.0	0.9	0.9	1.0	...
Shortleaf pine	243.7	50.3	60.9	54.5	35.0	25.8	10.5	6.7	...
Loblolly pine	1105.3	104.1	146.1	212.0	179.2	158.8	132.3	164.7	8.1
Spruce pine	25.9	0.5	4.3	3.6	4.3	5.7	3.4	4.0	...
Redcedar	7.4	0.7	1.7	1.6	1.5	1.4	0.5	...	...
Cypress	6.9	0.3	1.0	0.5	0.5	0.6	1.4	2.6	...
Total softwoods	1409.0	156.3	217.5	277.3	225.2	194.7	150.1	179.7	8.1
Select white oaks	109.6	...	16.7	24.6	17.8	15.5	11.7	22.0	1.2
Select red oaks	151.3	...	13.6	18.7	26.0	20.8	18.5	43.4	10.3
Other white oaks	28.6	...	4.4	8.3	3.7	2.7	2.1	7.0	0.4
Other red oaks	287.2	...	37.8	51.5	52.1	41.1	34.7	51.7	18.3
Sweet pecan	10.4	...	0.7	...	1.5	1.6	1.9	2.2	2.4
Water hickory	3.4	...	0.5	...	0.5	...	0.6	1.3	0.5
Other hickories	60.1	...	12.9	11.0	12.2	6.3	7.9	9.7	...
Persimmon	0.3	...	0.3	...	...	...	...	...	...
Hard maple	1.6	...	...	1.1	...	...	0.5	...	...
Soft maple	1.5	...	0.9	0.2	0.4	...	...	...	...
Boxelder	5.6	...	2.5	2.9	0.2	...	...	...	...
Beech	35.5	...	1.7	6.6	8.4	4.0	4.3	8.4	2.1
Sweetgum	182.3	...	36.9	44.4	38.8	24.9	18.8	18.6	...
Blackgum	22.5	...	6.6	4.0	5.8	1.5	0.8	3.8	...
Other gums/tupelos	9.0	...	3.4	1.0	3.8	0.5	0.2	...	...
White ash	12.9	...	1.9	2.4	2.8	2.0	3.1	0.6	...
Other ashes	19.0	...	4.1	4.5	3.2	3.9	1.9	1.1	0.4
Sycamore	22.3	...	2.5	5.9	3.0	4.7	1.7	4.7	...
Cottonwood	38.4	...	0.9	1.1	4.6	5.6	5.0	11.1	10.1
Basswood	7.3	...	...	2.2	0.5	1.2	1.0	2.4	...
Yellow-poplar	76.4	...	8.5	9.3	16.9	12.9	7.9	19.0	1.8
Magnolia	9.3	...	0.6	1.2	3.0	2.1	1.4	0.6	0.4
Sweetbay	3.2	...	0.4	0.6	1.3	0.5	0.5	...	...
Willow	6.4	...	0.9	1.3	1.0	1.2	1.5	0.5	...
Black cherry	12.1	...	1.4	4.3	4.0	1.2	1.2	...	...
American elm	19.9	...	4.8	6.1	4.3	3.0	0.5	0.8	0.4
Other elms	11.6	...	3.6	4.4	2.5	...	1.1	...	...
River birch	0.8	...	...	0.8	...	...	...	...	...
Hackberry	18.3	...	3.9	5.6	2.3	3.0	2.6	0.8	...
Other locusts	1.6	...	...	...	0.5	0.5	0.6	...	...
Sassafras	4.0	...	...	1.0	0.4	...	1.0	1.7	...
Dogwood	0.3	...	...	...	0.3	...	...	...	...
Holly	1.0	...	0.5	0.4	...	...	...	...	...
Total hardwoods	1173.5	...	173.1	225.2	221.8	160.6	133.1	211.4	48.3
All species	2582.5	156.3	390.6	502.5	447.0	355.4	283.2	391.1	56.4

**Table 36—Volume of timber on timberland by species and class of timber,
Southwest Mississippi, 1987**

Species	All live	Growing stock	Rough	Rotten
----- Million cubic feet -----				
Longleaf pine	14.9	14.3	...	0.6
Slash pine	9.3	8.7	0.6	...
Shortleaf pine	348.5	344.8	3.7	...
Loblolly pine	1402.3	1353.3	47.6	1.3
Spruce pine	31.8	30.3	1.5	...
Redcedar	14.9	11.9	2.8	0.2
Cypress	10.0	9.6	0.4	...
Total softwoods	1831.6	1773.0	56.5	2.1
Select white oaks	210.5	184.4	21.6	4.5
Select red oaks	227.6	202.9	20.7	4.1
Other white oaks	65.4	57.0	8.0	0.4
Other red oaks	563.3	466.7	82.5	14.1
Sweet pecan	18.2	14.2	3.9	...
Water hickory	5.2	5.2	...	...
Other hickories	109.2	97.0	11.2	1.0
Persimmon	4.0	3.3	0.7	...
Hard maple	4.8	3.2	1.6	...
Soft maple	17.0	10.7	5.8	0.5
Boxelder	23.1	15.1	7.6	0.4
Beech	68.8	49.0	13.6	6.3
Sweetgum	474.4	410.4	55.0	9.0
Blackgum	57.1	42.7	13.5	0.9
Other gums/tupelos	22.9	20.7	1.3	0.9
White ash	23.8	21.6	1.7	0.4
Other ashes	42.7	36.0	6.6	0.1
Sycamore	49.5	42.8	5.9	0.8
Cottonwood	45.4	43.7	...	1.7
Basswood	11.6	10.2	1.2	0.2
Yellow-poplar	112.5	100.7	9.3	2.6
Magnolia	19.6	14.8	4.5	0.4
Sweetbay	8.2	5.8	1.6	0.8
Willow	13.3	11.1	1.0	1.2
Black walnut	1.4	1.0	0.5	...
Black cherry	34.7	27.3	6.4	1.0
American elm	44.8	34.0	10.4	0.3
Other elms	41.2	32.8	7.2	1.3
River birch	0.9	0.9	...	...
Hackberry	64.1	46.0	17.4	0.7
Black locust	4.6	2.8	1.2	0.5
Other locusts	6.4	3.4	2.9	0.1
Sassafras	8.2	6.7	1.3	0.2
Dogwood	11.9	5.5	5.9	0.4
Holly	5.5	3.0	2.2	0.2
Other commercial	5.4	1.6	3.3	0.5
Total hardwoods	2427.3	2034.0	337.7	55.5
Noncommercial	71.9	...	71.9	...
All species	4330.8	3807.1	466.1	57.6

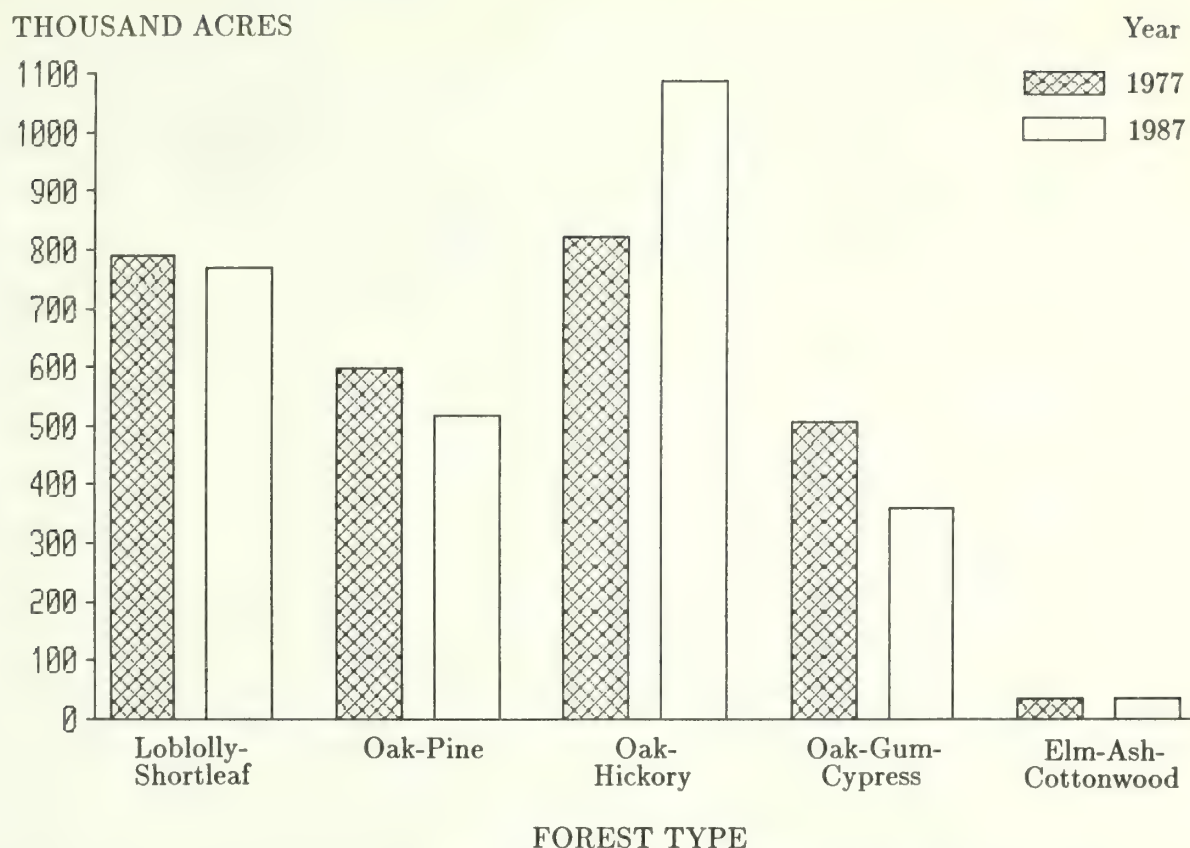


Figure 1.—Area of timberland by forest type, Southwest Mississippi, 1977 and 1987.

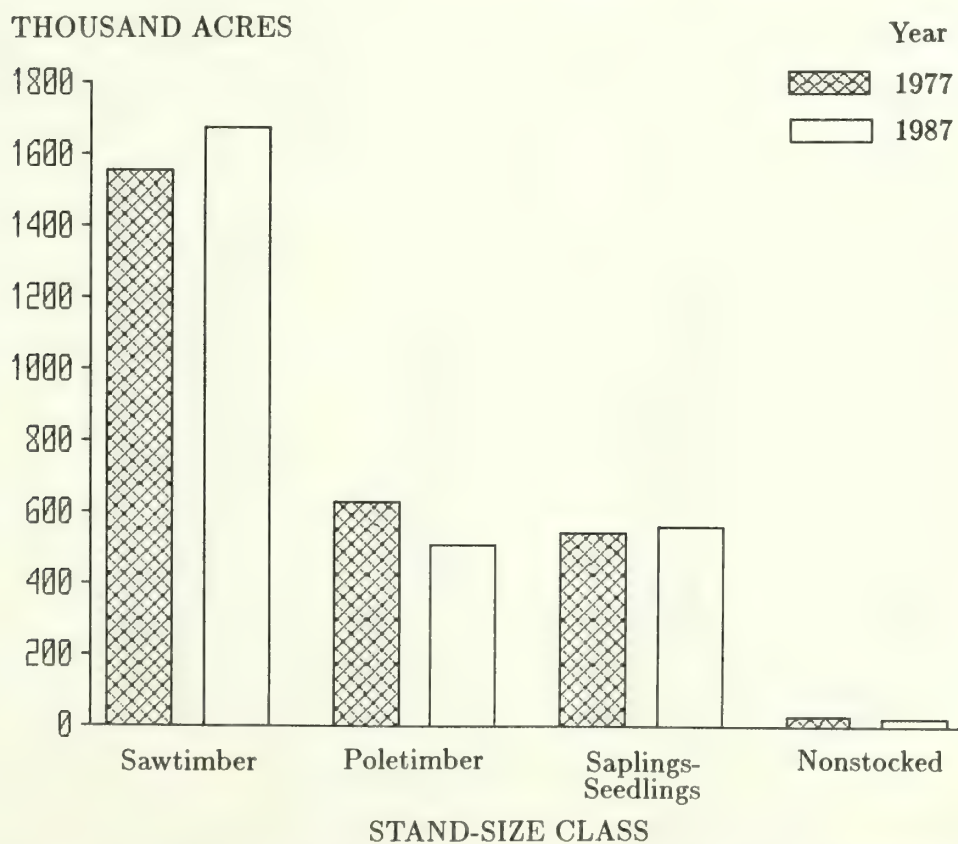


Figure 2.—Area of timberland by stand-size class, Southwest Mississippi, 1977 and 1987.

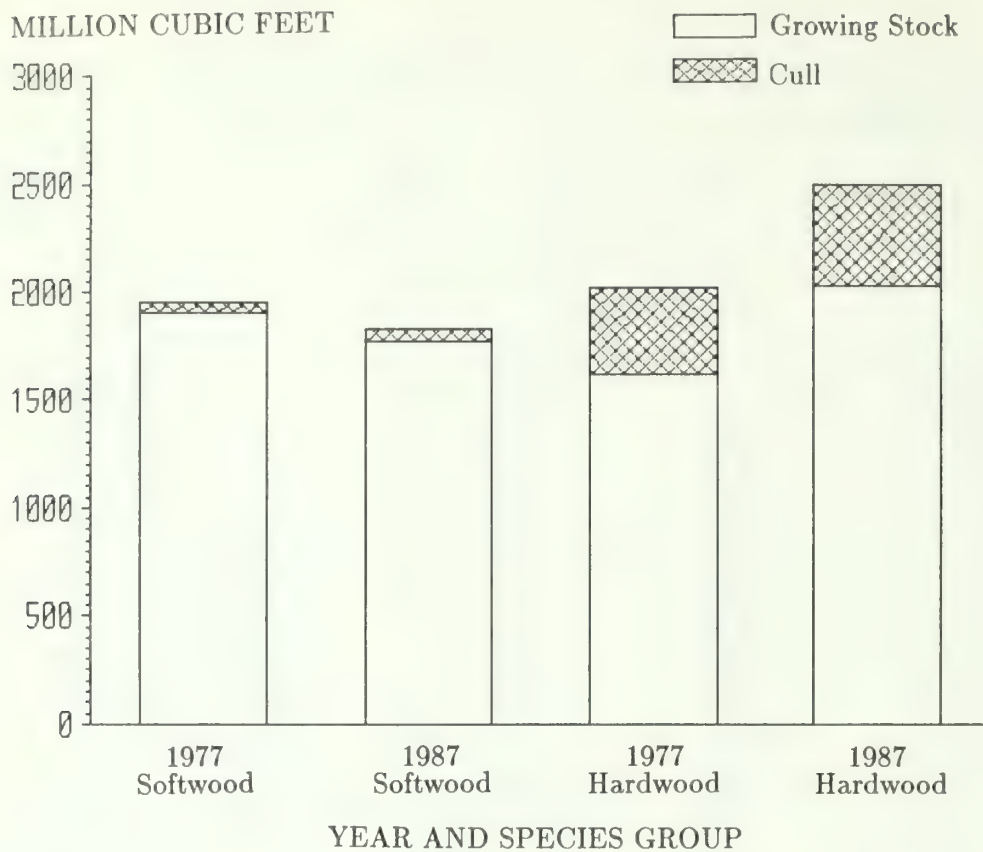


Figure 3.—Volume of timber on timberland by species group and class of timber, Southwest Mississippi, 1977 and 1987.

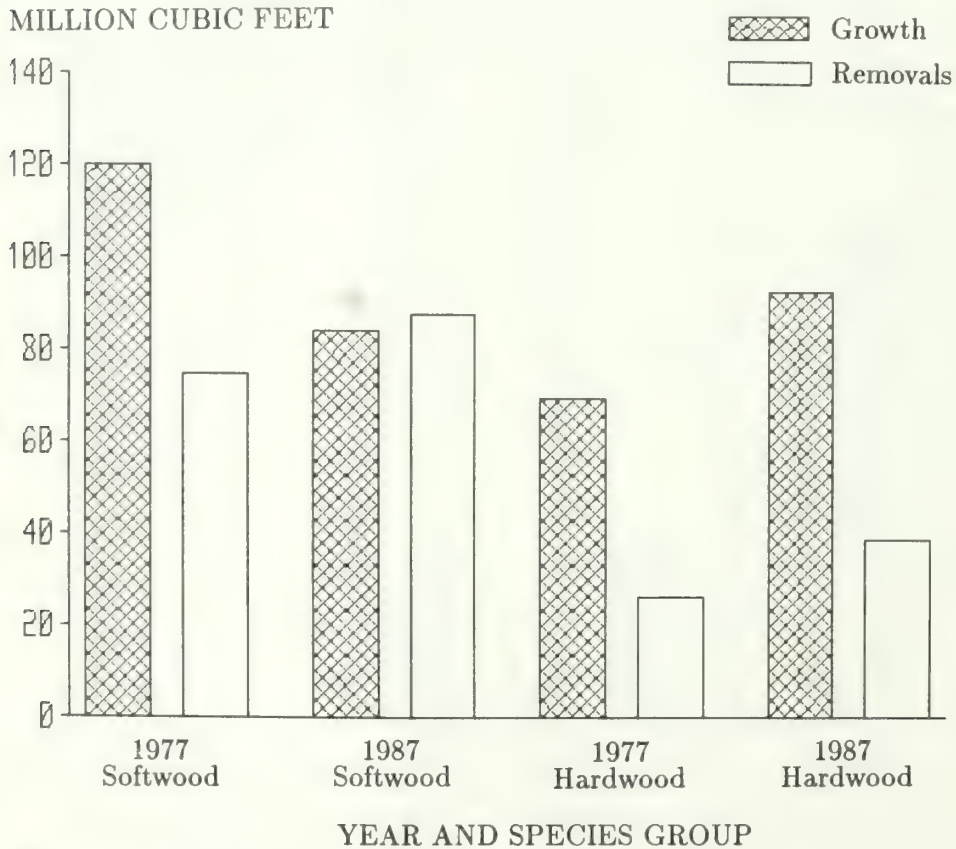


Figure 4.—Average net annual growth and average annual removals of growing stock on timberland by species group, Southwest Mississippi, 1977 and 1987.

MILLION CUBIC FEET

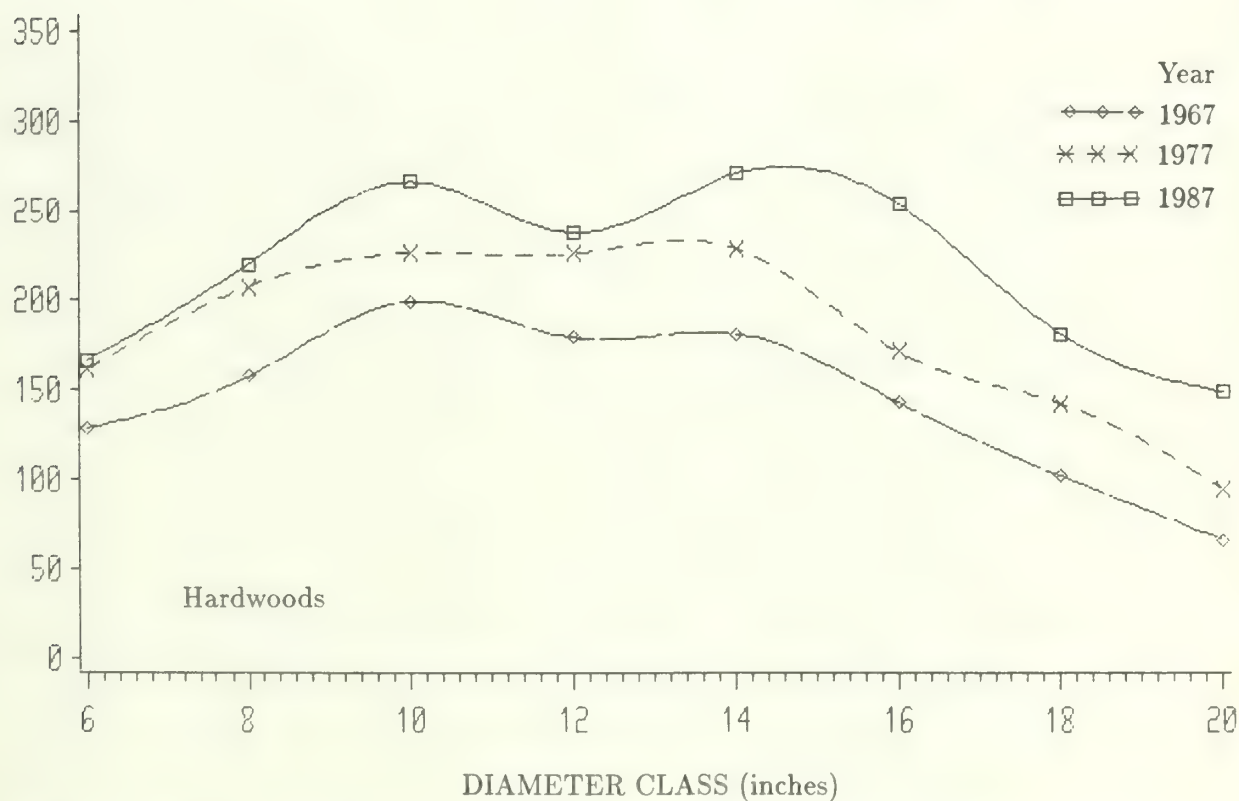
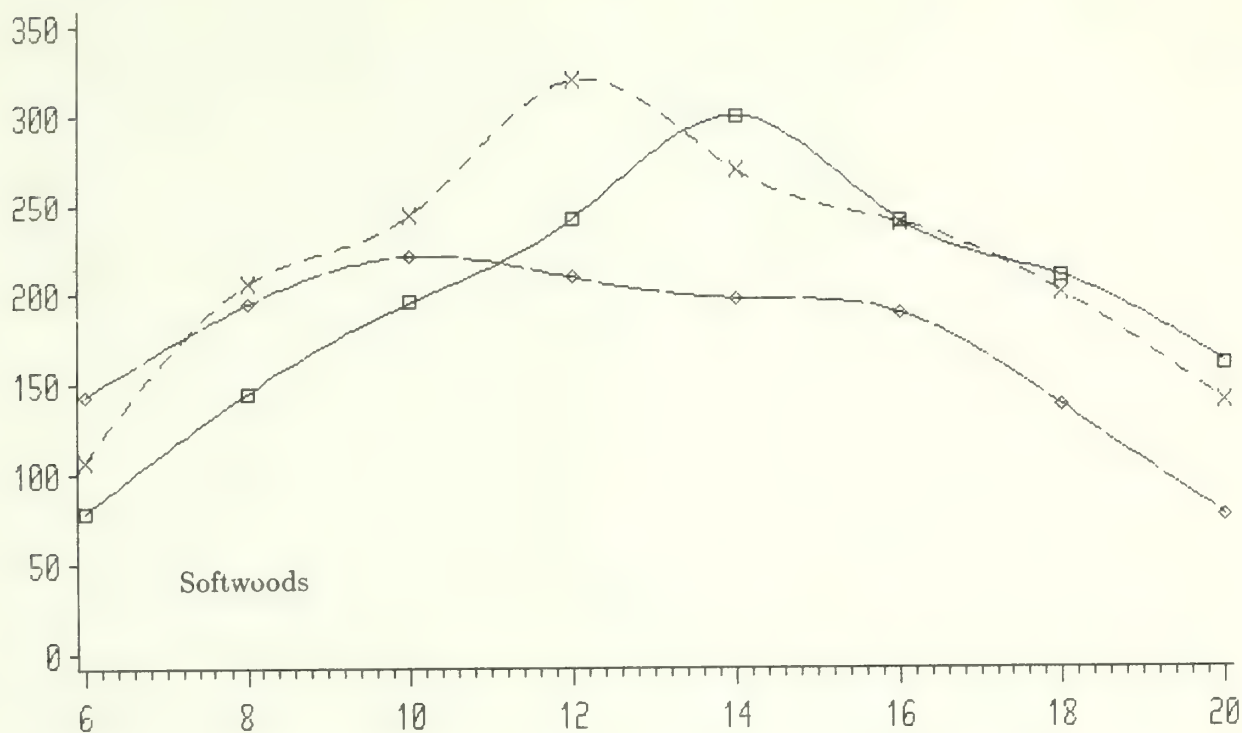


Figure 5.—Volume of softwood and hardwood growing stock on timberland by diameter class, Southwest Mississippi, 1967, 1977, and 1987.

MILLION TREES

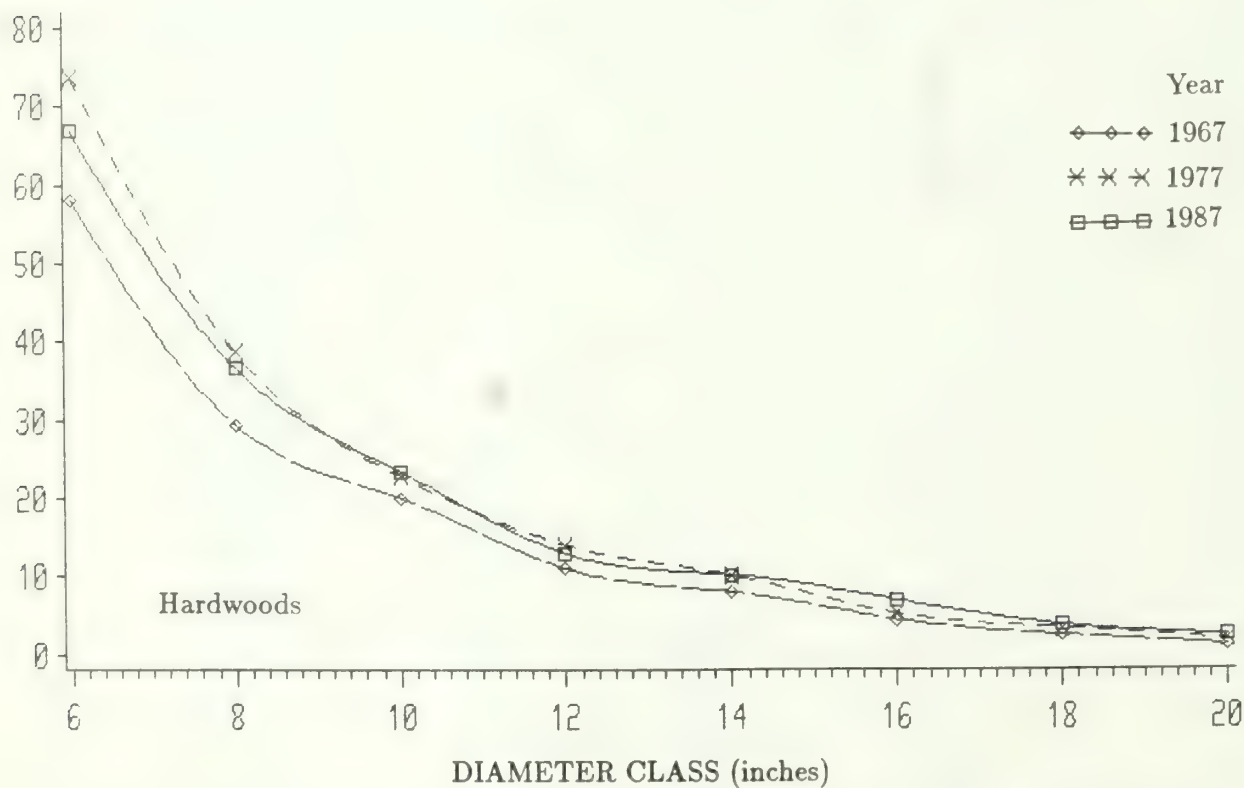
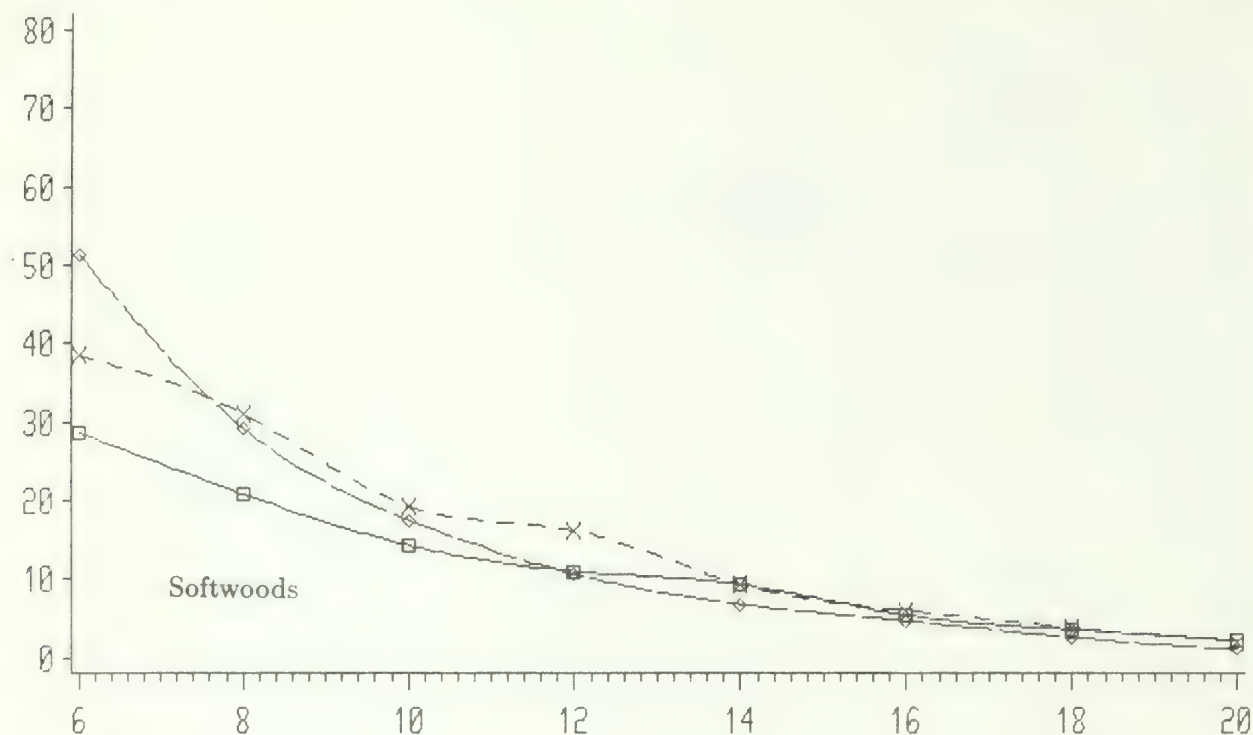


Figure 6.—Number of softwood and hardwood growing stock trees on timberland by diameter class, Southwest Mississippi, 1967, 1977, and 1987.

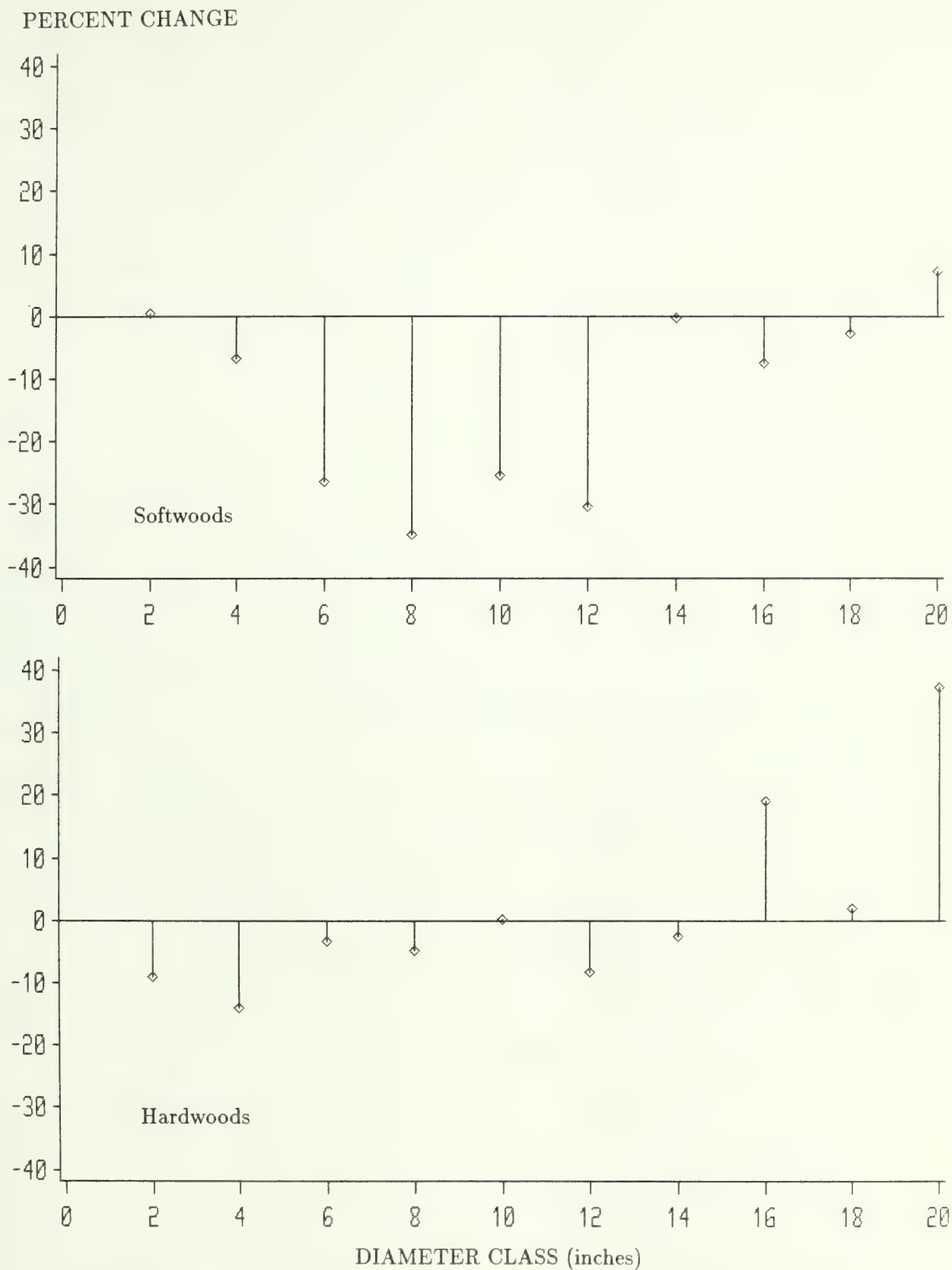


Figure 7.—Percent change in the number of live softwood and hardwood trees by diameter class, Southwest Mississippi, 1977 to 1987.

Kelly, John F. and Hines, F. Dee, Forest Statistics for Southwest Mississippi counties—1987. Resourc. Bull. SO- 128 . New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 1987. 33 p.

Tabulates forest resource information from a new inventory of Southwest Mississippi counties.

Additional Keywords: Area, volume, forest type, stand size, ownership.

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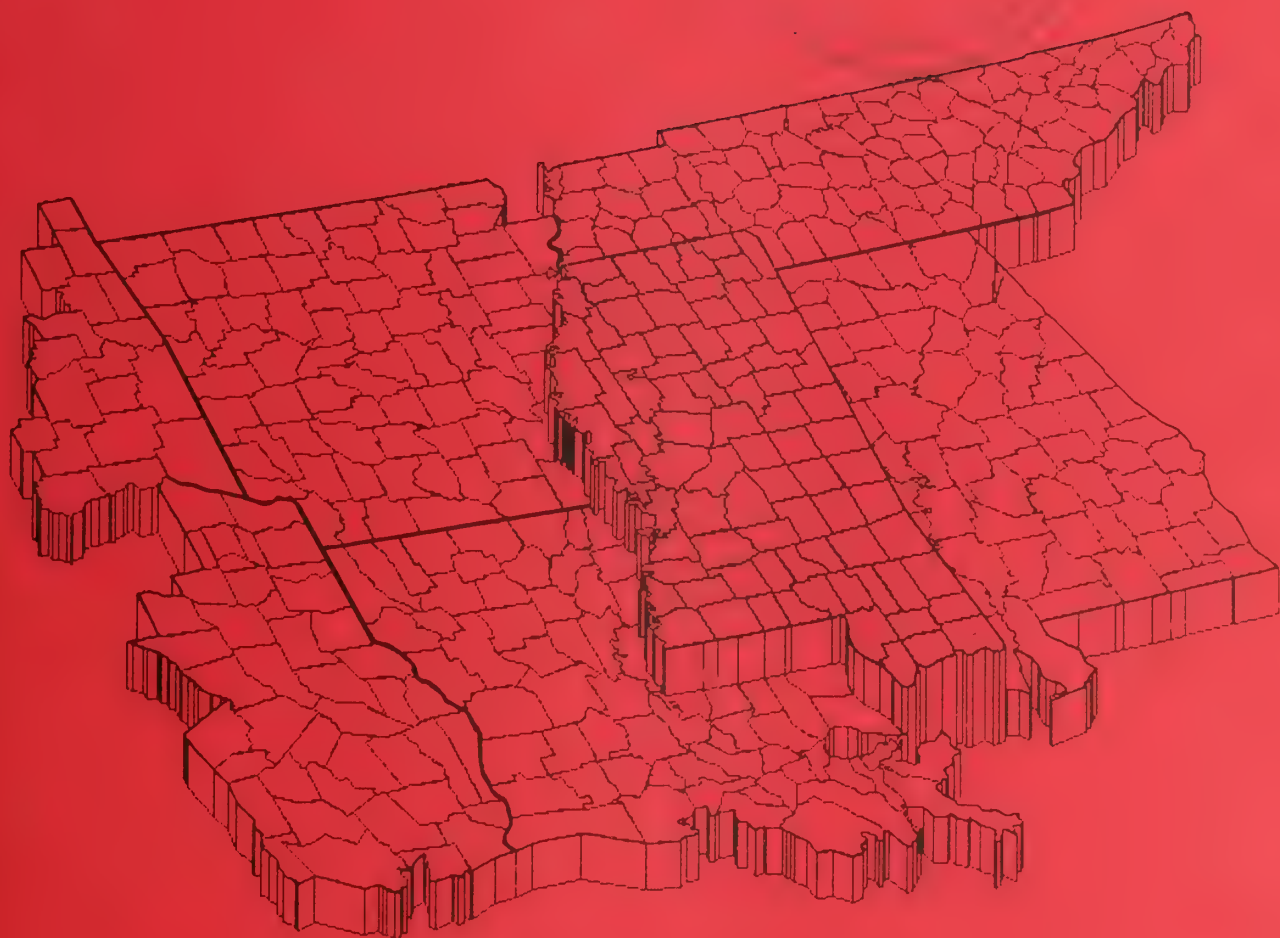
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Forest Statistics for Mississippi Counties - 1987

Bryan L. Donner and F. Dee Hines



FOREWORD

The Southern Forest Survey, an activity of the Southern Forest Experiment Station Forest Inventory and Analysis work unit, covers the States of Alabama, Arkansas, Louisiana, Mississippi, East Oklahoma, Tennessee, and East Texas, and the territory of Puerto Rico.

This survey is part of the nationwide Forest Survey originally authorized by the McSweeney-McNary Research Act of 1928. More recent legislation pertinent to the survey mission includes the Forest and Rangeland Renewable Resources Planning Act of 1974 and the Forest and Rangeland Renewable Resources Research Act of 1978. The survey mission is to develop, analyze, and maintain renewable forest resource information. This information is essential for formulation of forest policies and programs.

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*Core tables are presented in response to the Southern Industrial Forestry Research Council's recommendations. These tables are identical among Forest Inventory and Analysis units in the eastern United States.



Figure I.—The forest survey regions of Mississippi.

Forest Statistics for Mississippi Counties—1987

Bryan L. Donner and F. Dee Hines

INTRODUCTION

The tables and figures in this report were derived from data obtained through a multi-resource inventory of the 82 counties and five survey regions comprising the state of Mississippi (fig. 1). The data on forest acreage and timber volume were secured by a three-step process. First, a forest-nonforest classification was accomplished on aerial photographs for points representing approximately 230 acres. Second, these photo classifications were adjusted on the basis of ground observations at sample locations representing approximately 3,840 acres. Finally, forest locations at the intersections of a grid of lines spaced 3 miles apart were subjected to on-the-ground measurements. At these forest locations, per-acre estimates were obtained from trees measured on a cluster of ten 37.5 basal area factor prism points.

The sampling methods were designed to achieve suitable sampling errors for estimates of area and volume at the state level. Sampling error increases as the area or volume considered decreases. The sampling errors presented in table I, equal to one standard deviation for the sample data, may be used to construct confidence intervals for population parameters. For example, at the 95 percent confidence level, the confidence interval for growing-stock volume (in million cubic feet) in the entire state (with a sampling error of 1.8 percent) is

$$19,425.5 \pm 1.96(0.018 \times 19,425.5) = \\ 19,425.5 \pm 685.3$$

where 1.96 is the number of standard deviations. This confidence interval indicates that the actual growing-stock volume lies in the range 18,740.2 to 20,110.8 million cubic feet, unless a 1 in 20 chance of a random event has occurred. Conversely, the confidence interval for growing-stock volume in a smaller area of consideration, such as Adams County (with a sampling error of 16.4 percent), is 259.9 ± 83.5 or 176.4 to 343.4 million cubic feet.

Sampling errors for any combination of county data in the state may be estimated by using the following procedure:

$$SE_g = \frac{SE_t \sqrt{X_t}}{\sqrt{X_g}}$$

where:

- SE = standard error of estimate
(expressed as a percent)
- X = variable of interest
(area or volume)
- g = total for the group of counties
to be combined
- t = total for the state

For example, the sampling error for growing-stock volume of Choctaw, Noxubee, Oktibbeha, and Winston counties combined is 7.4 percent. Therefore, the confidence interval for growing-stock volume in these four counties is 1152.1 ± 167.1 million cubic feet.

Clarification of three items in the tables and figures is necessary. First, information for several counties in the Delta region was combined in the tables because of the small amount of timberland in those counties. In-

Table I—*Sampling errors¹ for timberland, growing stock, and sawtimber, Mississippi, 1987*

County	Timberland	Growing stock			Sawtimber volume
		Volume	Growth	Removals	
		----- Percent -----			
Adams	2.3	16.4	11.6	26.0	20.2
Alcorn	2.0	11.5	10.4	26.7	17.5
Amite	2.3	9.7	8.7	19.7	11.1
Attala	2.1	11.8	9.0	15.6	12.6
Benton	2.8	16.2	18.0	35.2	20.1
Bolivar	0.8	12.0	(2)	40.4	17.4
Calhoun	1.2	9.3	11.3	15.5	13.3
Carroll	2.2	14.9	11.9	26.2	20.3
Chickasaw	2.6	17.1	15.2	(2)	20.1
Choctaw	2.4	14.9	10.3	16.6	20.7
Claiborne	2.1	9.3	9.5	30.6	10.5
Clarke	1.8	12.8	12.2	12.7	15.1
Clay	2.1	13.8	19.9	15.1	18.3
Coahoma	1.2	11.9	(2)	44.3	18.0
Copiah	1.9	9.0	7.0	13.1	10.8
Covington	2.3	24.7	25.0	19.1	30.2
De Soto	1.6	22.2	27.4	(2)	29.5
Forrest	3.2	12.4	9.5	12.2	14.4
Franklin	2.4	9.7	9.8	21.3	11.3
George	3.4	15.5	17.8	24.0	16.6
Greene	1.5	11.5	8.2	16.8	15.7
Grenada	3.2	18.2	17.8	38.7	23.0
Hancock	2.8	17.4	17.3	27.0	21.6
Harrison	2.2	13.4	12.4	22.3	16.6
Hinds	1.7	11.9	17.8	29.6	14.3
Holmes	1.8	11.6	8.9	31.4	16.7
Humphreys ³	1.0	15.7	24.4	23.6	19.8
Issaquena	2.4	14.5	19.8	23.3	17.2
Itawamba	3.1	15.6	9.1	15.1	21.2
Jackson	2.4	14.1	16.0	20.4	16.3
Jasper	2.5	16.0	9.8	17.5	20.8
Jefferson	2.7	11.6	11.2	27.2	15.2
Jefferson Davis	3.7	17.4	26.6	32.3	22.7
Jones	2.1	10.0	7.5	24.3	12.7
Kemper	2.0	11.0	10.3	16.4	12.8
Lafayette	1.9	10.3	9.7	18.5	14.8
Lamar	2.5	17.8	13.2	27.5	22.2
Lauderdale	2.2	10.0	8.3	14.4	11.8
Lawrence	2.1	15.1	13.6	22.2	19.8
Leake	2.5	14.6	9.8	14.7	17.3
Lee	2.5	24.2	29.6	33.5	34.4
Lincoln	3.3	15.3	12.3	27.6	17.5
Lowndes	3.6	20.2	19.7	11.5	27.3
Madison	1.7	14.3	13.3	27.9	17.0
Marion	2.1	11.6	9.9	15.9	13.4
Marshall	2.4	15.4	15.5	31.9	20.7

**Table I—Sampling errors¹ for timberland, growing stock, and sawtimber,
Mississippi, 1987 — Continued**

County	Timberland	Growing stock			Sawtimber volume
		Volume	Growth	Removals	
----- <i>Percent</i> -----					
Monroe	2.3	8.8	10.9	16.1	12.0
Montgomery	2.7	15.2	15.0	20.8	19.4
Neshoba	2.5	11.9	13.1	22.2	15.0
Newton	2.7	12.6	10.1	22.2	14.4
Noxubee	1.7	11.2	11.2	27.0	13.7
Oktibbeha	2.7	12.5	13.3	28.7	15.5
Panola	1.9	15.0	27.3	35.2	21.0
Pearl River	2.1	11.5	12.1	16.4	14.7
Perry	1.8	10.2	11.8	13.5	11.8
Pike	4.3	16.3	18.7	32.6	20.8
Pontotoc	2.7	14.0	10.9	13.6	20.2
Prentiss	2.7	16.7	6.5	31.6	20.6
Quitman ⁴	1.3	19.6	38.0	22.3	24.9
Rankin	1.9	9.9	14.5	22.7	12.5
Scott	2.5	9.7	8.3	19.4	12.2
Sharkey	1.3	18.3	20.9	16.9	21.4
Simpson	3.2	13.2	10.8	17.4	16.9
Smith	2.7	9.3	10.4	15.0	11.4
Stone	2.1	10.5	11.0	18.0	12.9
Sunflower ⁵	0.7	16.4	15.7	48.4	24.1
Tallahatchie	1.3	18.0	16.2	31.7	23.5
Tate	3.5	29.6	18.4	29.0	39.5
Tippah	2.9	10.8	11.2	28.3	14.8
Tishomingo	2.5	15.1	13.4	21.8	19.3
Union	3.6	26.9	20.6	37.3	34.2
Walthall	2.8	22.3	19.4	37.4	24.8
Warren	2.0	13.2	12.0	15.3	17.1
Wayne	1.6	10.9	8.7	12.7	13.3
Webster	2.6	11.3	15.0	17.2	16.1
Wilkinson	1.7	10.7	11.2	21.4	12.0
Winston	2.2	11.6	11.3	25.4	15.7
Yalobusha	2.3	10.6	14.1	15.7	14.1
Yazoo	1.7	8.8	7.2	22.4	11.9
All counties	0.3	1.8	1.5	2.7	2.2

¹ By random-sampling formula.

² Sampling error greater than 50.

³ Leflore included in Humphreys.

⁴ Tunica included in Quitman.

⁵ Washington included in Sunflower.

formation in the figures, however, was not. Care should therefore be taken when comparing table and figure data for Humphreys, Leflore, Quitman, Sunflower, Tunica, and Washington counties. Second, negative net growth values in table 18 can be attributed to high volumes of certain negative components of the growth equation, such as mortality and cull increment. Third, the unexpected values reported for the hemlock-spruce species group in tables 32 through 36 are represented entirely by Atlantic white-cedar, found in the Gulf Coast area. Atlantic white-cedar is considered a part of the hemlock-spruce species group.

Tables 1-25 were developed to provide compatibility among Forest Inventory and Analysis Projects. Tables 26-36 are supplementary tables and may change from unit to unit or state to state to address specific resource issues.

DEFINITION OF TERMS

Average net annual growth.—Average net annual volume increase for the inter-survey period.

Average annual mortality.—Average annual sound-wood volume of growing-stock trees dying from natural causes.

Average annual removals.—Average net annual volume of growing-stock trees removed from the inventory by harvesting, cultural operations (such as timber-stand improvement), land clearing, or changes in land use.

Commercial species.—Tree species which normally develop into trees suitable for industrial wood products.

Forest type.—A classification of forest land based upon those tree species forming a plurality of live-tree stocking.

Growing-stock trees.—Live trees of commercial species. Rough and rotten trees are excluded.

Growing-stock volume.—The cubic-foot volume of sound wood in growing-stock trees at least 5.0 inches in diameter at breast

height, from a 1-foot stump to a minimum 4.0-inch top diameter outside bark of the central stem, or to the point where the central stem breaks into limbs.

Live trees.—Commercial and noncommercial tree species of sapling size or larger.

Natural stands.—Stands with no evidence of artificial regeneration. This includes those stands established by seed tree regeneration methods.

Noncommercial species.—Tree species of typically small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products.

Planted stands.—Stands with some evidence of planting or direct seeding.

Poletimber trees.—Growing-stock trees at least 5.0 inches in diameter at breast height, but smaller than sawtimber size.

Reserved timberland.—Productive public forest land withdrawn from timber utilization through statute or administrative regulations.

Rotten trees.—Live trees of commercial species that do not contain at least one 12-foot saw log in the butt 16 feet, now or prospectively, primarily because of rot.

Rough trees.—Live trees of commercial species that do not contain at least one 12-foot saw log in the butt 16 feet, now or prospectively, primarily because of roughness or poor form. Also included are all live trees of noncommercial species.

Saplings.—Growing-stock trees at least 1.0 inch but less than 5.0 inches in diameter at breast height.

Sawtimber trees.—Growing-stock trees that contain at least a 12-foot saw log in the butt 16 feet and meet regional specifications for freedom from defect. Softwoods must be at least 9.0 inches in diameter at breast height and hardwoods at least 11.0 inches in diameter at breast height.

Sawtimber volume.—Sound-wood volume of the saw-log portion of growing-stock sawtimber trees in board feet, International 1/4-inch rule, and in cubic feet.

Seedlings.—Growing-stock trees less than 1.0 inch in diameter at breast height and greater than one foot tall for hardwoods, greater than six inches tall for softwoods, and greater than one-half inch in diameter at ground level for longleaf pine.

Site class.—A classification of forest land in terms of inherent capacity to grow crops of industrial wood.

Stand-size class.—A classification of forest land based on the diameter size class of growing-stock trees on the sampled area; that is, sawtimber, poletimber, or sapling and seedling.

Timberland.—Forest land that is producing, or is capable of producing, crops of industrial wood and not withdrawn from timber utilization. Timberland is synonymous with “commercial forest land” in prior reports.

Tree grade.—A classification of the volume of the saw-log portion of sawtimber trees based on the log grade of the butt log.

Woodland.—Forest land incapable of yielding crops of industrial wood because of adverse site conditions.

CORE TABLES 1-25

Table 1—Area by county and land class, Mississippi, 1987

County	All land ¹	Forest land			Reserved timberland	Nonforest land
		Total	Timberland ²	Woodland ³		
----- Thousand acres -----						
Adams	291.9	194.5	194.5	...	...	97.4
Alcorn	256.5	138.7	138.7	...	...	117.8
Amite	468.4	331.8	331.8	...	...	136.6
Attala	471.5	355.8	355.8	...	...	115.7
Benton	260.8	177.3	177.3	...	...	83.5
Bolivar	571.2	66.3	66.3	...	...	504.9
Calhoun	366.9	212.5	212.5	...	...	154.5
Carroll	405.6	223.8	223.8	...	...	181.8
Chickasaw	322.2	138.2	138.2	...	...	184.0
Choctaw	268.6	205.4	205.4	...	...	63.2
Claiborne	315.9	215.9	215.9	...	...	100.1
Clarke	443.0	356.4	356.4	...	...	86.6
Clay	265.9	113.8	113.8	...	...	152.1
Coahoma	357.8	56.6	56.6	...	...	301.2
Copiah	498.5	348.2	348.2	...	...	150.3
Covington	266.5	160.6	160.6	...	...	105.9
De Soto	309.0	93.6	93.6	...	...	215.4
Forrest	300.0	218.3	218.3	...	...	81.7
Franklin	362.5	309.5	309.5	...	...	53.0
George	309.0	222.6	222.6	...	...	86.4
Greene	459.4	383.8	382.9	...	0.9	75.6
Grenada	269.4	140.7	140.7	...	...	128.6
Hancock	306.0	200.4	200.4	...	...	105.5
Harrison	371.6	253.5	253.5	...	...	118.1
Hinds	559.8	206.8	206.8	...	...	352.9
Holmes	486.0	255.9	255.9	...	...	230.0
Humphreys ⁴	662.3	99.2	99.2	...	...	563.1
Issaquena	260.1	98.4	98.4	...	...	161.7
Itawamba	345.9	233.4	233.4	...	...	112.5
Jackson	468.1	336.9	336.9	...	...	131.2
Jasper	433.8	353.4	353.4	...	...	80.4
Jefferson	334.8	239.7	239.7	...	...	95.1
Jefferson Davis	261.6	143.1	143.1	...	...	118.5
Jones	445.1	295.5	295.5	...	...	149.6
Kemper	490.5	361.3	361.3	...	...	129.2
Lafayette	428.1	285.0	285.0	...	...	143.1
Lamar	319.5	222.7	222.7	...	...	96.8
Lauderdale	451.0	347.3	347.3	...	...	103.7
Lawrence	278.3	203.3	203.3	...	...	75.0
Leake	373.9	257.2	257.2	...	...	116.7
Lee	288.4	73.3	73.3	...	...	215.1
Leflore ⁴	...	...	...	...	...	...
Lincoln	375.4	259.4	259.4	...	...	116.0
Lowndes	331.0	137.8	137.8	...	...	193.2
Madison	459.2	181.9	181.9	...	...	277.4
Marion	350.7	211.4	211.4	...	...	139.3
Marshall	453.6	243.1	243.1	...	...	210.5

Table 1—Area by county and land class, Mississippi, 1987 — Continued

County	All land ¹	Forest land			Reserved timberland	Nonforest land
		Total	Timberland ²	Woodland ³		
----- Thousand acres -----						
Monroe	494.1	240.6	240.6	...	...	253.5
Montgomery	261.0	156.7	156.7	...	...	104.3
Neshoba	365.8	236.3	236.3	...	...	129.5
Newton	371.1	251.1	251.1	...	...	120.0
Noxubee	446.6	212.7	212.7	...	...	233.9
Oktibbeha	293.9	165.8	164.6	...	1.2	128.1
Panola	444.5	145.2	145.2	...	...	299.2
Pearl River	523.8	340.1	340.1	...	...	183.6
Perry	416.4	356.0	351.5	...	4.6	60.3
Pike	262.5	154.2	154.2	...	...	108.4
Pontotoc	319.4	146.3	146.3	...	...	173.1
Prentiss	267.2	151.9	151.9	...	...	115.3
Quitman ⁵	554.3	89.6	89.6	...	...	464.7
Rankin	500.5	306.7	306.7	...	...	193.8
Scott	390.3	258.4	258.4	...	...	132.0
Sharkey	278.3	72.7	72.7	...	...	205.6
Simpson	378.0	240.2	240.2	...	...	137.8
Smith	406.5	284.8	284.8	...	...	121.7
Stone	285.3	228.4	228.4	...	...	56.9
Sunflower ⁶	921.2	98.6	98.6	...	...	822.6
Tallahatchie	416.3	97.2	97.2	...	...	319.2
Tate	259.6	82.7	82.7	...	...	176.9
Tippah	293.3	196.1	196.1	...	...	97.2
Tishomingo	277.7	193.7	193.7	...	...	84.0
Tunica ⁵	...	...	...	...	...	...
Union	266.5	120.7	120.7	...	...	145.8
Walthall	258.8	129.3	129.3	...	...	129.5
Warren	381.7	214.2	212.3	...	1.9	167.6
Washington ⁶	...	...	...	...	...	...
Wayne	520.2	428.4	428.4	...	...	91.8
Webster	271.4	185.7	185.7	...	...	85.7
Wilkinson	434.2	324.1	324.1	...	...	110.1
Winston	390.2	275.5	275.5	...	...	114.8
Yalobusha	305.7	200.6	200.6	...	...	105.1
Yazoo	597.2	241.6	241.6	...	...	355.6
All counties	30228.9	16990.1	16981.6	...	8.6	13238.8

¹ From U.S. Bureau of the Census.

² Forest land (formerly termed commercial forest land) that is producing or capable of producing at least 20 cubic feet of industrial wood per acre per year. Includes areas which may be inaccessible or inoperable by current standards. Excludes reserved timberlands.

³ Forest land incapable of producing 20 cubic feet of industrial wood per acre per year under natural conditions because of adverse site conditions.

⁴ Leflore included in Humphreys.

⁵ Tunica included in Quitman.

⁶ Washington included in Sunflower.

Table 2—Area of timberland by county and ownership class, Mississippi, 1987

County	All ownerships	National forest	Misc. federal	State	County and municipal	Forest industry ¹	Farmer	Corporate ²	Individual ²
----- Thousand acres -----									
Adams	194.5	15.0	...	15.0	...	10.0	49.9	15.0	89.8
Alcorn	138.7	...	...	...	...	...	66.9	...	71.7
Amite	331.8	21.8	...	38.1	...	32.6	103.4	5.4	130.6
Attala	355.8	...	5.8	...	...	87.5	70.0	5.8	186.7
Benton	177.3	50.7	...	...	...	6.3	63.3	...	57.0
Bolivar	66.3	...	...	16.6	...	8.3	16.6	4.1	20.7
Calhoun	212.5	...	...	...	...	85.0	63.7	...	63.7
Carroll	223.8	...	...	...	...	32.9	32.9	6.6	151.4
Chickasaw	138.2	36.4	...	...	...	14.5	21.8	...	65.4
Choctaw	205.4	10.8	...	...	...	48.6	37.8	...	108.1
Claiborne	215.9	...	5.8	5.8	...	52.5	40.8	17.5	93.3
Clarke	356.4	...	...	6.3	...	125.1	137.6	12.5	75.0
Clay	113.8	...	...	...	...	28.4	42.7	...	42.7
Coahoma	56.6	...	...	...	...	...	20.2	8.1	28.3
Copiah	348.2	9.7	...	9.7	...	82.2	120.9	19.3	106.4
Covington	160.6	...	...	...	...	27.9	34.9	...	97.7
De Soto	93.6	...	15.6	...	7.8	...	31.2	...	39.0
Forrest	218.3	44.6	...	...	9.9	19.8	9.9	24.8	109.1
Franklin	309.5	94.8	...	6.3	6.3	63.2	69.5	19.0	50.5
George	222.6	12.4	...	43.3	...	61.8	43.3	30.9	30.9
Greene	382.9	35.3	...	10.1	...	131.0	80.6	...	125.9
Grenada	140.7	...	13.4	...	...	26.8	67.0	...	33.5
Hancock	200.4	...	11.5	...	...	57.3	5.7	5.7	120.3
Harrison	253.5	55.8	...	5.1	15.2	71.0	10.1	15.2	81.1
Hinds	206.8	...	6.1	...	...	6.1	85.2	24.3	85.2
Holmes	255.9	...	19.2	...	...	25.6	108.8	25.6	76.8
Humphreys ³	99.2	...	8.3	...	8.3	...	24.8	16.5	41.3
Issaquena	98.4	...	...	...	5.5	54.6	5.5	16.4	16.4
Itawamba	233.4	...	15.6	...	...	41.5	46.7	...	129.7
Jackson	336.9	28.6	22.8	34.3	...	85.7	11.4	34.3	119.9
Jasper	353.4	17.7	...	...	...	94.2	82.5	...	159.0
Jefferson	239.7	5.8	...	5.8	...	76.0	64.3	...	87.7
Jefferson Davis	143.1	...	...	...	...	49.5	88.1	...	5.5
Jones	295.5	46.0	...	...	...	32.8	39.4	39.4	137.9
Kemper	361.3	...	5.6	...	...	116.7	72.3	...	166.7
Lafayette	285.0	42.5	30.3	...	...	24.3	127.4	...	60.6
Lamar	222.7	...	...	...	...	74.2	68.5	5.7	74.2
Lauderdale	347.3	...	5.8	...	11.6	75.2	34.7	5.8	214.1
Lawrence	203.3	...	...	...	...	41.9	131.6	12.0	17.9
Leake	257.2	...	...	...	...	92.6	82.3	10.3	72.0
Lee	73.3	...	...	...	...	...	22.0	...	51.3
Lincoln	259.4	11.8	...	...	...	11.8	76.6	11.8	147.4
Lowndes	137.8	...	...	...	...	6.6	19.7	...	111.5
Madison	181.9	...	...	...	14.7	29.5	63.9	9.8	63.9
Marion	211.4	...	...	11.1	...	38.9	77.9	27.8	55.6
Marshall	243.1	60.8	20.3	...	...	...	54.0	...	108.1

Table 2—Area of timberland by county and ownership class, Mississippi, 1987 — Continued

County	All ownerships	National forest	Misc. federal	State	County and municipal	Forest industry ¹	Farmer	Corporate ²	Individual ²
----- Thousand acres -----									
Monroe	240.6	...	...	...	...	58.7	58.7	29.3	93.9
Montgomery	156.7	...	...	...	...	48.6	27.0	...	81.0
Neshoba	236.3	...	...	...	...	34.5	49.2	9.8	142.8
Newton	251.1	5.5	...	...	...	43.7	114.6	...	87.3
Noxubee	212.7	...	11.5	...	...	63.2	40.2	11.5	86.2
Oktibbeha	164.6	...	8.2	12.3	...	8.2	32.9	...	102.9
Panola	145.2	...	21.8	...	...	...	65.3	...	58.1
Pearl River	340.1	...	6.2	...	6.2	92.8	68.0	6.2	160.8
Perry	351.5	151.5	...	...	...	78.8	30.3	6.1	84.8
Pike	154.2	...	...	...	...	7.0	91.1	...	56.1
Pontotoc	146.3	...	...	...	...	18.3	42.7	...	85.3
Prentiss	151.9	...	5.2	...	...	15.7	52.4	...	78.6
Quitman ⁴	89.6	...	...	...	...	...	52.3	...	37.3
Rankin	306.7	...	...	...	12.3	36.8	73.6	30.7	153.3
Scott	258.4	80.0	...	...	...	36.9	30.8	...	110.7
Sharkey	72.7	57.1	...	...	...	...	...	10.4	5.2
Simpson	240.2	...	...	...	...	60.1	46.7	6.7	126.8
Smith	284.8	76.7	...	...	...	43.8	16.4	...	147.9
Stone	228.4	56.0	...	12.9	...	64.6	21.5	4.3	68.9
Sunflower ⁵	98.6	...	9.0	...	...	9.0	35.9	17.9	26.9
Tallahatchie	97.2	...	...	...	...	...	54.7	...	42.5
Tate	82.7	...	6.9	...	...	...	6.9	...	68.9
Tippah	196.1	5.3	...	...	...	53.0	53.0	...	84.8
Tishomingo	193.7	...	6.7	...	...	40.1	13.4	...	133.6
Union	120.7	...	...	...	9.3	9.3	37.1	...	65.0
Walthall	129.3	...	...	...	...	6.2	30.8	...	92.4
Warren	212.3	...	5.7	5.7	...	34.4	40.2	22.9	103.3
Wayne	428.4	105.6	...	...	...	129.1	17.6	...	176.1
Webster	185.7	...	...	...	...	80.7	24.2	...	80.7
Wilkinson	324.1	28.2	...	7.0	...	119.8	70.5	7.0	91.6
Winston	275.5	24.5	18.4	...	...	67.3	30.6	...	134.7
Yalobusha	200.6	21.7	27.1	...	5.4	21.7	97.6	...	27.1
Yazoo	241.6	...	29.3	7.3	...	...	117.1	14.6	73.2
All counties	16981.6	1212.1	342.0	252.7	112.5	3332.8	4171.5	607.2	6950.7

¹ Includes land leased to forest industry.

² Indian land will be classed as corporate or individual as defined by the Bureau of Indian Affairs.

³ Leflore included in Humphreys.

⁴ Tunica included in Quitman.

⁵ Washington included in Sunflower.

Table 3—Area of timberland by county and forest type group, Mississippi, 1987

County	Total	Forest type group								
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-Gum Cypress	Elm-ash- Cottonwood	Nontyped ¹
		Planted	Natural	Planted	Natural					
----- Thousand acres -----										
Adams	194.5	...	...	...	5.0	15.0	134.7	19.9	19.9	...
Alcorn	138.7	...	...	9.6	19.1	19.1	81.3	9.6	...	...
Amite	331.8	...	...	...	146.9	59.8	103.4	21.8	...	...
Attala	355.8	...	...	23.3	64.2	81.7	140.0	46.7	...	...
Benton	177.3	...	...	12.7	31.7	25.3	82.3	25.3	...	...
Bolivar	66.3	...	...	...	...	...	4.1	45.6	16.6	...
Calhoun	212.5	...	...	35.4	7.1	92.1	77.9	...	...	...
Carroll	223.8	...	...	13.2	32.9	32.9	111.9	32.9	...	...
Chickasaw	138.2	...	...	7.3	29.1	43.6	58.2	...	...	...
Choctaw	205.4	...	...	10.8	43.2	75.7	70.3	5.4	...	...
Claiborne	215.9	...	...	5.8	...	11.7	140.0	58.3	...	...
Clarke	356.4	...	...	56.3	68.8	68.8	131.3	31.3	...	...
Clay	113.8	...	...	...	14.2	14.2	49.8	35.5	...	...
Coahoma	56.6	...	...	...	...	...	...	52.6	4.0	...
Copiah	348.2	...	...	38.7	58.0	77.4	120.9	53.2	...	...
Covington	160.6	...	...	7.0	14.0	41.9	48.9	48.9	...	...
De Soto	93.6	...	...	...	...	7.8	62.4	15.6	7.8	...
Forrest	218.3	14.9	19.8	19.8	29.8	74.4	29.8	29.8	...	...
Franklin	309.5	...	...	...	157.9	75.8	63.2	12.6	...	...
George	222.6	24.7	6.2	12.4	30.9	49.5	49.5	49.5	...	...
Greene	382.9	70.5	15.1	30.2	25.2	110.8	70.5	60.5	...	...
Grenada	140.7	...	...	26.8	20.1	33.5	46.9	13.4	...	...
Hancock	200.4	22.9	45.8	11.5	22.9	40.1	11.5	45.8	...	...
Harrison	253.5	10.1	91.3	10.1	5.1	81.1	15.2	40.6	...	...
Hinds	206.8	...	...	18.3	24.3	30.4	103.4	30.4	...	...
Holmes	255.9	...	...	19.2	19.2	38.4	115.2	64.0	...	...
Humphreys ²	99.2	...	...	...	...	...	...	99.2	...	...
Issaquena	98.4	...	...	...	...	...	5.5	92.9	...	...
Itawamba	233.4	...	...	15.6	25.9	51.9	93.4	46.7	...	...
Jackson	336.9	5.7	85.7	11.4	...	85.7	62.8	85.7	...	...
Jasper	353.4	...	...	17.7	70.7	76.6	135.5	53.0	...	...
Jefferson	239.7	...	...	23.4	23.4	17.5	134.5	35.1	5.8	...
Jefferson Davis	143.1	...	...	22.0	27.5	22.0	55.0	11.0	5.5	...
Jones	295.5	13.1	19.7	6.6	59.1	85.4	72.2	39.4	...	...
Kemper	361.3	...	...	83.4	100.0	83.4	38.9	55.6	...	...
Lafayette	285.0	...	...	18.2	84.9	72.8	72.8	36.4	...	...
Lamar	222.7	22.8	40.0	40.0	17.1	45.7	28.5	28.5	...	...
Lauderdale	347.3	...	...	28.9	115.8	52.1	104.2	46.3	...	...
Lawrence	203.3	...	6.0	12.0	53.8	65.8	23.9	41.9	...	...
Leake	257.2	...	...	36.0	51.4	46.3	92.6	30.9	...	...
Lee	73.3	...	...	7.3	...	7.3	36.7	22.0	..	...
Lincoln	259.4	...	...	17.7	82.5	59.0	82.5	17.7	...	...
Lowndes	137.8	...	...	6.6	...	26.2	19.7	78.7	6.6	...
Madison	181.9	...	...	9.8	29.5	44.2	44.2	54.1	...	...
Marion	211.4	5.6	5.6	...	44.5	72.3	44.5	38.9	...	...
Marshall	243.1	...	...	27.0	13.5	47.3	67.5	74.3	13.5	...

Table 3—Area of timberland by county and forest type group, Mississippi, 1987 — Continued

County	Total	Forest type group								
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-Gum Cypress	Elm-ash- Cottonwood	Nontyped ¹
		Planted	Natural	Planted	Natural					
----- Thousand acres -----										
Monroe	240.6	...	...	17.6	17.6	29.3	135.0	41.1	...	...
Montgomery	156.7	...	...	5.4	27.0	43.2	75.6	5.4	...	...
Neshoba	236.3	...	...	4.9	39.4	64.0	73.8	54.1	...	...
Newton	251.1	5.5	...	16.4	54.6	65.5	49.1	60.0	...	...
Noxubee	212.7	...	...	23.0	63.2	40.2	34.5	51.7	...	...
Oktibbeha	164.6	...	...	8.2	45.3	28.8	57.6	24.7	...	...
Panola	145.2	...	...	21.8	...	14.5	65.3	43.6	...	...
Pearl River	340.1	61.8	37.1	30.9	30.9	55.7	68.0	55.7	...	...
Perry	351.5	30.3	48.5	42.4	42.4	78.8	72.7	36.4	...	...
Pike	154.2	...	...	...	49.1	35.0	63.1	7.0	...	...
Pontotoc	146.3	...	...	12.2	18.3	36.6	73.1	6.1	...	...
Prentiss	151.9	5.2	...	10.5	15.7	36.7	73.3	10.5	...	...
Quitman ³	89.6	...	...	...	...	...	...	74.7	14.9	...
Rankin	306.7	...	...	6.1	61.3	85.9	98.1	55.2	...	...
Scott	258.4	...	...	...	80.0	43.1	110.7	24.6	...	...
Sharkey	72.7	...	...	...	...	...	...	72.7	...	...
Simpson	240.2	...	...	13.3	66.7	60.1	53.4	46.7	...	...
Smith	284.8	...	5.5	11.0	87.6	65.7	87.6	27.4	...	...
Stone	228.4	17.2	51.7	34.5	17.2	60.3	21.5	25.9	...	...
Sunflower ⁴	98.6	...	...	...	...	...	...	80.7	17.9	...
Tallahatchie	97.2	...	...	...	...	12.1	48.6	36.4	...	...
Tate	82.7	...	...	6.9	...	6.9	68.9	...	...	...
Tippah	196.1	...	...	37.1	37.1	10.6	84.8	21.2	5.3	...
Tishomingo	193.7	...	...	26.7	33.4	40.1	73.5	20.0	...	...
Union	120.7	...	...	...	9.3	27.9	74.3	9.3	...	...
Walthall	129.3	...	...	6.2	24.6	12.3	55.4	30.8	...	...
Warren	212.3	...	...	...	...	...	131.9	63.1	17.2	...
Wayne	428.4	23.5	23.5	35.2	88.0	117.4	88.0	52.8	...	...
Webster	185.7	...	...	24.2	24.2	56.5	72.7	...	...	8.1
Wilkinson	324.1	...	...	28.2	49.3	91.6	98.6	49.3	7.0	...
Winston	275.5	...	6.1	18.4	42.8	85.7	91.8	30.6	...	...
Yalobusha	200.6	...	...	10.8	32.5	48.8	92.2	16.3	...	...
Yazoo	241.6	...	...	...	...	7.3	146.4	80.5	7.3	...
All counties	16981.6	334.0	507.5	1203.7	2727.1	3522.9	5477.2	3051.7	149.5	8.1

¹ Timberland with no current stocking.

² Leflore included in Humphreys.

³ Tunica included in Quitman.

⁴ Washington included in Sunflower.

**Table 4—Area of timberland by county and stand-size class,
Mississippi, 1987**

County	All classes	Stand-size class		Sapling- seedling	Nonstocked ¹ areas
		Sawtimber	Poletimber		
-----Thousand acres-----					
Adams	194.5	124.7	39.9	29.9	...
Alcorn	138.7	62.2	38.3	38.3	...
Amite	331.8	223.0	54.4	54.4	...
Attala	355.8	110.8	105.0	134.2	5.8
Benton	177.3	107.6	57.0	...	12.7
Bolivar	66.3	58.0	8.3	...	...
Calhoun	212.5	77.9	49.6	85.0	...
Carroll	223.8	118.5	59.2	39.5	6.6
Chickasaw	138.2	65.4	43.6	29.1	...
Choctaw	205.4	86.5	70.3	48.6	...
Claiborne	215.9	145.8	29.2	35.0	5.8
Clarke	356.4	112.6	106.3	131.3	6.3
Clay	113.8	64.0	14.2	35.5	...
Coahoma	56.6	48.5	8.1	...	...
Copiah	348.2	174.1	87.1	87.1	...
Covington	160.6	48.9	20.9	90.7	...
De Soto	93.6	62.4	15.6	7.8	7.8
Forrest	218.3	94.3	54.6	69.5	...
Franklin	309.5	252.7	25.3	31.6	...
George	222.6	68.0	74.2	74.2	6.2
Greene	382.9	151.1	146.1	85.6	...
Grenada	140.7	87.1	33.5	20.1	...
Hancock	200.4	51.5	80.2	68.7	...
Harrison	253.5	91.3	45.6	111.6	5.1
Hinds	206.8	139.9	36.5	30.4	...
Holmes	255.9	134.4	70.4	51.2	...
Humphreys ²	99.2	57.9	33.1	8.3	...
Issaquena	98.4	71.0	16.4	...	10.9
Itawamba	233.4	93.4	77.8	62.2	...
Jackson	336.9	119.9	74.2	137.0	5.7
Jasper	353.4	100.1	76.6	170.8	5.9
Jefferson	239.7	122.8	58.5	58.5	...
Jefferson Davis	143.1	27.5	44.0	66.1	5.5
Jones	295.5	190.4	46.0	59.1	...
Kemper	361.3	139.0	94.5	127.8	...
Lafayette	285.0	163.7	91.0	18.2	12.1
Lamar	222.7	68.5	57.1	97.1	...
Lauderdale	347.3	219.9	40.5	86.8	...
Lawrence	203.3	83.7	47.8	65.8	6.0
Leake	257.2	97.7	51.4	102.9	5.1
Lee	73.3	29.3	29.3	14.7	...
Lincoln	259.4	117.9	64.9	76.6	...
Lowndes	137.8	65.6	45.9	26.2	...
Madison	181.9	88.5	34.4	59.0	...
Marion	211.4	105.7	44.5	61.2	...
Marshall	243.1	87.8	81.0	60.8	13.5

**Table 4—Area of timberland by county and stand-size class,
Mississippi, 1987 — Continued**

County	All classes	Stand-size class			Nonstocked ¹ areas
		Sawtimber	Poletimber	Sapling- seedling	
-----Thousand acres-----					
Monroe	240.6	117.4	93.9	29.3	...
Montgomery	156.7	48.6	43.2	59.4	5.4
Neshoba	236.3	118.1	44.3	73.8	...
Newton	251.1	125.6	43.7	76.4	5.5
Noxubee	212.7	132.2	28.7	51.7	...
Oktibbeha	164.6	90.6	28.8	45.3	...
Panola	145.2	58.1	65.3	14.5	7.3
Pearl River	340.1	99.0	92.8	148.4	...
Perry	351.5	133.3	84.8	127.3	6.1
Pike	154.2	98.1	28.0	28.0	...
Pontotoc	146.3	30.5	61.0	54.9	...
Prentiss	151.9	52.4	57.6	41.9	...
Quitman ³	89.6	67.2	22.4	...	...
Rankin	306.7	208.5	55.2	42.9	...
Scott	258.4	153.8	67.7	36.9	...
Sharkey	72.7	46.7	20.8	5.2	...
Simpson	240.2	86.8	80.1	73.4	...
Smith	284.8	164.3	38.3	76.7	5.5
Stone	228.4	86.2	56.0	86.2	...
Sunflower ⁴	98.6	71.7	17.9	...	9.0
Tallahatchie	97.2	66.8	30.4	...	...
Tate	82.7	34.4	13.8	27.6	6.9
Tippah	196.1	68.9	74.2	53.0	...
Tishomingo	193.7	73.5	80.1	26.7	13.4
Union	120.7	55.7	18.6	46.4	...
Walthall	129.3	49.3	18.5	61.6	...
Warren	212.3	177.8	34.4	...	...
Wayne	428.4	176.1	111.5	140.8	...
Webster	185.7	40.4	56.5	80.7	8.1
Wilkinson	324.1	190.2	49.3	70.5	14.1
Winston	275.5	122.4	85.7	67.3	...
Yalobusha	200.6	92.2	59.6	48.8	...
Yazoo	241.6	168.4	58.6	14.6	...
All counties	16981.6	8116.8	4203.9	4458.8	202.0

¹ Timberland less than 16.7 percent stocked.

² Leflore included in Humphreys.

³ Tunica included in Quitman.

⁴ Washington included in Sunflower.

**Table 5—Area of timberland by county and site class,
Mississippi, 1987**

County	All classes	Site class (cubic feet/acre/year)				
		>165	120-165	85-120	50-85	<50
----- Thousand acres -----						
Adams	194.5	49.9	94.8	44.9	5.0	...
Alcorn	138.7	...	38.3	33.5	66.9	...
Amite	331.8	108.8	163.2	38.1	21.8	...
Attala	355.8	23.3	93.3	175.0	64.2	...
Benton	177.3	25.3	44.3	88.7	19.0	...
Bolivar	66.3	33.1	12.4	16.6	4.1	...
Calhoun	212.5	7.1	77.9	77.9	49.6	...
Carroll	223.8	46.1	65.8	72.4	39.5	...
Chickasaw	138.2	14.5	80.0	29.1	14.5	...
Choctaw	205.4	32.4	70.3	70.3	32.4	...
Claiborne	215.9	110.8	29.2	46.7	29.2	...
Clarke	356.4	37.5	68.8	137.6	100.0	12.5
Clay	113.8	...	71.1	35.5	7.1	...
Coahoma	56.6	12.1	28.3	12.1	4.0	...
Copiah	348.2	38.7	101.6	183.8	24.2	...
Covington	160.6	27.9	83.8	48.9	...	...
De Soto	93.6	23.4	15.6	46.8	7.8	...
Forrest	218.3	59.5	39.7	79.4	39.7	...
Franklin	309.5	107.4	139.0	44.2	19.0	...
George	222.6	6.2	43.3	98.9	74.2	...
Greene	382.9	45.3	90.7	191.4	55.4	...
Grenada	140.7	20.1	20.1	80.4	13.4	6.7
Hancock	200.4	...	11.5	85.9	97.4	5.7
Harrison	253.5	5.1	40.6	126.8	60.8	20.3
Hinds	206.8	79.1	73.0	42.6	12.2	...
Holmes	255.9	51.2	64.0	121.6	19.2	...
Humphreys ¹	99.2	8.3	33.1	49.6	8.3	...
Issaquena	98.4	38.3	5.5	43.7	5.5	5.5
Itawamba	233.4	15.6	108.9	67.4	41.5	...
Jackson	336.9	5.7	28.6	85.7	177.0	40.0
Jasper	353.4	53.0	111.9	111.9	76.6	...
Jefferson	239.7	70.2	87.7	70.2	11.7	...
Jefferson Davis	143.1	5.5	22.0	77.1	38.5	...
Jones	295.5	85.4	131.3	78.8	...	...
Kemper	361.3	50.0	66.7	150.1	94.5	...
Lafayette	285.0	48.5	66.7	121.3	48.5	...
Lamar	222.7	17.1	51.4	102.8	51.4	...
Lauderdale	347.3	52.1	138.9	92.6	57.9	5.8
Lawrence	203.3	35.9	83.7	77.7	6.0	...
Leake	257.2	56.6	77.2	102.9	20.6	...
Lee	73.3	22.0	22.0	22.0	7.3	...
Lincoln	259.4	41.3	100.2	70.7	47.2	...
Lowndes	137.8	19.7	45.9	65.6	6.6	...
Madison	181.9	39.3	29.5	88.5	24.6	...
Marion	211.4	16.7	72.3	94.6	27.8	...
Marshall	243.1	13.5	47.3	155.3	27.0	...

**Table 5—Area of timberland by county and site class,
Mississippi, 1987 — Continued**

County	All classes	Site class (cubic feet/acre/year)				
		>165	120-165	85-120	50-85	<50
----- Thousand acres -----						
Monroe	240.6	23.5	70.4	111.5	29.3	5.9
Montgomery	156.7	16.2	21.6	86.4	27.0	5.4
Neshoba	236.3	34.5	73.8	123.1	4.9	...
Newton	251.1	27.3	92.8	103.7	21.8	5.5
Noxubee	212.7	34.5	63.2	69.0	46.0	...
Oktibbeha	164.6	8.2	65.9	53.5	28.8	8.2
Panola	145.2	14.5	21.8	29.0	79.9	...
Pearl River	340.1	12.4	86.6	92.8	123.7	24.7
Perry	351.5	54.5	103.0	151.5	42.4	...
Pike	154.2	56.1	49.1	49.1	...	...
Pontotoc	146.3	6.1	36.6	79.2	24.4	...
Prentiss	151.9	15.7	36.7	41.9	57.6	...
Quitman ²	89.6	...	37.3	44.8	7.5	...
Rankin	306.7	30.7	85.9	177.9	12.3	...
Scott	258.4	49.2	123.0	49.2	30.8	6.2
Sharkey	72.7	5.2	26.0	36.4	5.2	...
Simpson	240.2	20.0	46.7	153.5	20.0	...
Smith	284.8	5.5	76.7	175.3	27.4	...
Stone	228.4	30.2	64.6	94.8	38.8	...
Sunflower ³	98.6	9.0	17.9	53.8	17.9	...
Tallahatchie	97.2	6.1	18.2	72.9	...	...
Tate	82.7	27.6	13.8	27.6	13.8	...
Tippah	196.1	10.6	31.8	111.3	42.4	...
Tishomingo	193.7	6.7	66.8	100.2	20.0	...
Union	120.7	9.3	37.1	65.0	9.3	...
Walthall	129.3	...	30.8	92.4	6.2	...
Warren	212.3	80.3	45.9	45.9	40.2	...
Wayne	428.4	46.9	129.1	193.7	52.8	5.9
Webster	185.7	8.1	40.4	104.9	32.3	...
Wilkinson	324.1	56.4	98.6	155.0	14.1	...
Winston	275.5	30.6	61.2	128.5	55.1	...
Yalobusha	200.6	27.1	48.8	81.3	43.4	...
Yazoo	241.6	36.6	124.4	73.2	7.3	...
All counties	16981.6	2458.9	4937.6	6785.5	2641.4	158.2

¹ Leflore included in Humphreys.

² Tunica included in Quitman.

³ Washington included in Sunflower.

Table 6—Area of timberland by county and stocking classes of growing-stock trees, Mississippi, 1987

County	All classes	Stocking class (percent)				
		>130	100-130	60-100	16.7-60	<16.7
----- <i>Thousand acres</i> -----						
Adams	194.5	...	10.0	99.7	84.8	...
Alcorn	138.7	...	19.1	90.9	28.7	...
Amite	331.8	...	92.5	185.0	54.4	...
Attala	355.8	5.8	105.0	221.6	17.5	5.8
Benton	177.3	...	25.3	120.3	19.0	12.7
Bolivar	66.3	...	4.1	24.9	37.3	...
Calhoun	212.5	28.3	7.1	134.6	42.5	...
Carroll	223.8	...	26.3	125.1	65.8	6.6
Chickasaw	138.2	7.3	14.5	94.5	21.8	...
Choctaw	205.4	5.4	43.2	129.7	27.0	...
Claiborne	215.9	5.8	11.7	128.3	64.2	5.8
Clarke	356.4	12.5	50.0	200.1	87.5	6.3
Clay	113.8	...	21.3	56.9	35.5	...
Coahoma	56.6	...	4.0	40.4	12.1	...
Copiah	348.2	4.8	53.2	212.8	77.4	...
Covington	160.6	7.0	20.9	62.8	69.8	...
De Soto	93.6	...	15.6	39.0	31.2	7.8
Forrest	218.3	5.0	29.8	143.9	39.7	...
Franklin	309.5	...	113.7	157.9	37.9	...
George	222.6	...	12.4	154.6	49.5	6.2
Greene	382.9	5.0	65.5	216.6	95.7	...
Grenada	140.7	6.7	46.9	67.0	20.1	...
Hancock	200.4	...	51.5	74.5	74.5	...
Harrison	253.5	5.1	15.2	187.6	40.6	5.1
Hinds	206.8	...	24.3	146.0	36.5	...
Holmes	255.9	...	12.8	153.6	89.6	...
Humphreys ¹	99.2	...	8.3	49.6	41.3	...
Issaquena	98.4	...	...	65.6	21.9	10.9
Itawamba	233.4	5.2	72.6	124.5	31.1	...
Jackson	336.9	17.1	74.2	148.5	91.4	5.7
Jasper	353.4	29.5	70.7	176.7	70.7	5.9
Jefferson	239.7	5.8	23.4	116.9	93.5	...
Jefferson Davis	143.1	16.5	22.0	60.5	38.5	5.5
Jones	295.5	13.1	52.5	170.7	59.1	...
Kemper	361.3	...	100.0	216.8	44.5	...
Lafayette	285.0	6.1	72.8	157.7	36.4	12.1
Lamar	222.7	...	40.0	131.3	51.4	...
Lauderdale	347.3	11.6	127.3	191.0	17.4	...
Lawrence	203.3	...	53.8	107.6	35.9	6.0
Leake	257.2	20.6	41.2	133.8	56.6	5.1
Lee	73.3	...	22.0	22.0	29.3	...
Lincoln	259.4	...	41.3	176.9	41.3	...
Lowndes	137.8	...	13.1	78.7	45.9	...
Madison	181.9	9.8	39.3	113.0	19.7	...
Marion	211.4	...	38.9	139.1	33.4	...
Marshall	243.1	6.8	27.0	87.8	108.1	13.5

Table 6—Area of timberland by county and stocking classes of growing-stock trees, Mississippi, 1987 — Continued

County	All classes	Stocking class (percent)				
		>130	100-130	60-100	16.7-60	<16.7
----- <i>Thousand acres</i> -----						
Monroe	240.6	...	58.7	123.2	58.7	...
Montgomery	156.7	...	27.0	70.2	54.0	5.4
Neshoba	236.3	4.9	39.4	157.5	34.5	...
Newton	251.1	10.9	38.2	169.2	27.3	5.5
Noxubee	212.7	...	51.7	138.0	23.0	...
Oktibbeha	164.6	4.1	28.8	98.8	32.9	...
Panola	145.2	7.3	14.5	79.9	36.3	7.3
Pearl River	340.1	12.4	30.9	235.0	61.8	...
Perry	351.5	12.1	72.7	224.2	36.4	6.1
Pike	154.2	7.0	21.0	49.1	77.1	...
Pontotoc	146.3	18.3	36.6	73.1	18.3	...
Prentiss	151.9	...	21.0	89.1	41.9	...
Quitman ²	89.6	...	...	37.3	52.3	...
Rankin	306.7	18.4	98.1	147.2	42.9	...
Scott	258.4	24.6	30.8	147.6	55.4	...
Sharkey	72.7	...	...	46.7	26.0	...
Simpson	240.2	...	66.7	113.4	60.1	...
Smith	284.8	16.4	49.3	180.8	32.9	5.5
Stone	228.4	17.2	47.4	120.7	43.1	...
Sunflower ³	98.6	...	...	62.7	26.9	9.0
Tallahatchie	97.2	6.1	6.1	42.5	42.5	...
Tate	82.7	...	13.8	27.6	34.4	6.9
Tippah	196.1	5.3	37.1	106.0	47.7	...
Tishomingo	193.7	6.7	33.4	106.9	33.4	13.4
Union	120.7	...	27.9	65.0	27.9	...
Walthall	129.3	...	18.5	37.0	73.9	...
Warren	212.3	...	11.5	120.5	80.3	...
Wayne	428.4	11.7	88.0	258.2	70.4	...
Webster	185.7	24.2	40.4	80.7	32.3	8.1
Wilkinson	324.1	7.0	42.3	162.1	98.6	14.1
Winston	275.5	12.2	61.2	165.3	36.7	...
Yalobusha	200.6	5.4	43.4	130.1	21.7	...
Yazoo	241.6	...	14.6	131.8	95.2	...
All counties	16981.6	473.2	3007.6	9534.3	3764.4	202.0

¹ Leflore included in Humphreys.

² Tunica included in Quitman.

³ Washington included in Sunflower.

Table 7—Area of timberland by forest type and ownership class, Mississippi, 1987

Forest type ¹	All ownerships	National forest	Other public	Forest industry	Forest industry- leased	Other private
----- Thousand acres -----						
Longleaf-slash pine	841.5	186.5	47.1	256.4	4.3	347.2
Loblolly-shortleaf pine	3930.7	307.4	124.7	1058.7	54.7	2385.2
Softwood total	4772.2	493.9	171.9	1315.1	59.0	2732.4
Oak-pine	3522.9	357.3	124.0	668.3	21.6	2351.7
Oak-hickory	5477.2	232.8	154.8	730.8	32.3	4326.4
Oak-gum-cypress	3051.7	121.5	237.0	465.6	22.6	2205.1
Elm-ash-cottonwood	149.5	6.8	19.5	9.4	...	113.8
Hardwood total	12201.3	718.2	535.3	1874.2	76.5	8997.1
Nontyped ²	8.1	...	...	8.1	...	...
All types	16981.6	1212.1	707.1	3197.3	135.5	11729.4

¹ Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

² Timberland with no current stocking.

Table 8—Area of timberland by ownership and stocking classes of growing-stock trees, Mississippi, 1987

Ownership class	All classes	Stocking class (percent)				
		>130	100-130	60-100	16.7-60	<16.7
----- <i>Thousand acres</i> -----						
National forest	1212.1	55.1	232.3	780.4	131.5	12.8
Other public	707.1	11.8	114.4	399.8	154.5	26.6
Forest industry	3197.3	218.8	768.9	1621.1	538.4	50.0
Forest industry-leased	135.5	10.5	32.4	87.5	5.1	...
Other private	11729.4	176.9	1859.5	6645.6	2934.8	112.6
All ownerships	16981.6	473.2	3007.6	9534.3	3764.4	202.0

Table 9—Area of timberland by forest type and stand-size class, Mississippi, 1987

Forest type ¹	All classes	Stand-size class		Sapling- seedling	Nonstocked ² areas
		Sawtimber	Poletimber		
----- Thousand acres -----					
Longleaf-slash pine	841.5	341.9	209.3	284.2	6.1
Loblolly-shortleaf pine	3930.7	2098.5	852.0	973.7	6.6
Softwood total	4772.2	2440.4	1061.3	1257.8	12.6
Oak-pine	3522.9	1560.5	888.7	1073.6	...
Oak-hickory	5477.2	2184.5	1433.9	1784.1	74.7
Oak-gum-cypress	3051.7	1855.3	783.4	326.4	86.6
Elm-ash-cottonwood	149.5	76.1	36.6	16.8	20.1
Hardwood total	12201.3	5676.3	3142.6	3200.9	181.3
Nontyped ³	8.1	...	...	...	8.1
All types	16981.6	8116.8	4203.9	4458.8	202.0

¹ Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

² Timberland less than 16.7 percent stocked.

³ Timberland with no current stocking.

Table 10—Number of live trees on timberland by species and diameter class, Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Thousand trees -----													
Longleaf-slash pines	342435	125578	89689	54780	30270	17581	11976	6776	3610	1545	470	161	...
Shortleaf-loblolly pine	1735003	684822	423638	226866	158841	93351	63454	39975	22111	11402	5659	4733	152
Other yellow pines	14789	4266	1647	2148	1911	1146	1129	873	543	406	391	320	9
Cypress	40418	18888	13083	3140	1979	1015	927	297	283	271	112	321	103
Other softwoods	123331	84720	21168	10183	3878	1812	747	510	174	110	21	9	...
Total softwoods	2255977	918274	549225	297116	196879	114906	78232	48430	26720	13733	6652	5545	264
Select white oaks	305917	157632	65029	30247	17176	11175	8146	6176	4276	2488	1491	1906	175
Select red oaks	107055	47197	20468	11034	8297	4940	4209	3155	2873	1654	1049	1794	384
Other white oaks	255189	129265	46774	27253	19634	12317	7891	5385	3034	1385	964	1039	250
Other red oaks	1031352	635107	151950	82084	50548	38759	25201	17827	11392	7103	4339	5910	1132
Hickory	466325	330941	62489	27215	13952	10859	8128	5461	3003	1855	1210	1121	91
Hard maple	15211	10944	2297	1060	356	262	135	68	45	13	24	5	...
Soft maple	678984	505445	108262	36935	14336	6782	3776	1751	899	411	194	182	10
Beech	38900	22550	6581	2720	1447	1066	674	871	845	710	411	890	134
Sweetgum	1470047	920377	289021	128148	61477	34248	16049	10035	5243	2634	1273	1434	108
Tupelo-blackgum	617776	433449	85424	39785	24402	13798	8921	6044	3225	1483	608	575	62
Ash	184937	122025	27515	14987	7690	4676	3185	2002	1230	731	431	403	62
Cottonwood-aspen	4523	...	993	387	1127	390	246	214	210	226	190	343	198
Basswood	6422	5066	...	77	470	189	189	248	76	24	31	53	...
Yellow-poplar	165129	110486	18523	11936	7350	4551	3992	3103	2207	1203	678	979	120
Black walnut	3080	612	1062	623	284	283	83	40	35	27	30	...	...
Other hardwoods	2045218	1467070	365310	104111	47616	26051	12983	9653	5608	2968	1953	1677	218
Total hardwoods	7396067	4898166	1251698	518603	276163	170347	103806	72033	44202	24916	14877	18314	2944
Noncommercial	925435	720273	120448	55524	18446	7503	1641	787	529	183	73	26	3
All species	10577479	6536713	1921372	871242	491488	292755	183679	121250	71450	38832	21602	23884	3211

Table 11—Number of growing-stock trees on timberland by species and diameter class, Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----													
Longleaf-slash pines	304180	105307	76920	51701	29460	16741	11777	6577	3599	1522	421	154	...
Shortleaf-loblolly pine	1428705	501393	343293	201592	150259	89485	61362	38942	21434	10978	5389	4464	114
Other yellow pines	11502	2222	1107	1836	1726	1055	1129	810	505	406	382	314	9
Cypress	32688	15112	9993	2862	1924	749	851	278	252	217	94	295	60
Other softwoods	83865	55033	14973	8344	3212	1266	520	305	140	59	12	...	...
Total softwoods	1860940	679067	446286	266336	186581	109296	75639	46911	25931	13183	6299	5228	183
Select white oaks	162416	49040	41410	25672	15356	10276	7039	5360	3568	2147	1104	1398	46
Select red oaks	58191	11899	12720	8654	7504	4361	3667	2912	2539	1443	916	1398	176
Other white oaks	107106	24643	21306	20163	16077	10110	5917	4245	2286	888	754	630	87
Other red oaks	485875	198299	86156	65345	44544	34427	20080	14645	9414	5440	3339	3749	435
Hickory	170662	80214	31642	20563	11983	9474	6843	4391	2528	1394	796	780	55
Hard maple	5789	2592	1626	858	311	183	101	68	26	13	11	...	...
Soft maple	162569	87475	39740	20120	7585	3941	2110	909	331	232	81	46	...
Beech	12562	4902	671	2144	1261	886	434	611	596	427	201	402	27
Sweetgum	675549	317674	146559	98479	53085	30324	12778	8394	4212	2052	970	974	49
Tupelo-blackgum	184150	73208	40120	24923	18933	11590	6418	4692	2558	1104	360	236	7
Ash	65555	27813	11970	9873	6297	3639	2264	1536	873	604	367	276	42
Cottonwood-aspen	3511	...	457	263	915	390	213	214	181	208	190	296	184
Basswood	1556	510	...	77	391	189	61	201	36	24	21	47	...
Yellow-poplar	110947	67099	13488	9498	6625	3924	3299	2678	1814	1130	504	805	82
Black walnut	1463	...	536	492	144	134	33	40	35	27	21	...	...
Other hardwoods	502957	250402	126998	55511	30501	17675	7851	6394	3350	2039	1204	935	98
Total hardwoods	2710856	1195769	575400	362635	221512	141523	79108	57291	34346	19173	10840	11970	1287
All species	4571796	1874837	1021686	628971	408093	250819	154746	104202	60277	32356	17139	17199	1471

Table 12—Volume of growing stock on timberland by species and diameter class, Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)									
		5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
		-----Million cubic feet-----									
Longleaf-slash pines	1275.5	130.2	191.9	218.4	253.5	206.7	151.4	81.9	27.8	13.9	...
Shortleaf-loblolly pine	7447.9	519.8	968.4	1163.0	1252.3	1182.5	893.1	606.9	382.5	457.3	21.9
Other yellow pines	189.5	5.8	11.0	12.3	22.5	26.8	22.0	25.2	28.0	34.2	1.6
Cypress	108.5	5.5	11.3	10.0	16.7	8.1	8.9	10.5	4.8	24.3	8.3
Other softwoods	65.4	17.1	17.0	11.3	7.2	6.0	4.1	2.2	0.5	...	...
Total softwoods	9086.8	678.4	1199.5	1415.1	1552.2	1430.0	1079.5	726.7	443.7	529.8	31.8
Select white oaks	939.8	67.1	95.9	116.1	126.6	139.3	126.5	94.0	61.8	104.6	7.9
Select red oaks	616.6	23.4	45.3	47.4	67.4	76.6	88.4	68.9	52.9	117.7	28.7
Other white oaks	593.8	45.9	82.5	96.3	88.6	90.3	63.6	34.2	34.4	45.6	12.3
Other red oaks	2577.1	173.5	265.5	367.5	341.0	352.8	307.4	232.6	182.8	289.3	64.7
Hickory	715.6	48.1	67.5	99.2	117.6	112.2	89.4	63.3	46.3	64.1	7.9
Hard maple	11.8	2.5	1.8	2.2	2.1	1.5	0.8	0.4	0.6	...	...
Soft maple	213.7	50.1	43.8	39.3	33.7	20.8	10.1	8.9	3.8	3.2	...
Beech	129.9	5.2	6.6	9.7	6.8	15.3	20.1	19.4	11.4	31.1	4.3
Sweetgum	1771.0	220.7	310.4	336.7	240.2	230.8	163.3	106.1	64.5	90.7	7.6
Tupelo-blackgum	674.7	57.7	104.7	124.8	109.2	113.6	83.0	45.4	19.4	16.2	0.7
Ash	279.0	26.0	38.8	39.2	38.6	37.4	29.4	26.0	19.7	18.9	5.2
Cottonwood-aspen	126.6	0.7	6.2	4.3	4.0	5.0	7.3	11.4	12.7	34.1	40.8
Basswood	19.9	0.3	2.5	2.0	1.5	5.5	1.3	1.2	1.1	4.5	...
Yellow-poplar	502.0	25.9	43.1	47.0	61.9	74.5	72.6	56.9	32.9	72.5	14.7
Black walnut	7.2	0.7	0.5	1.4	0.5	1.1	1.1	1.1	0.8	...	...
Other hardwoods	1160.0	138.3	180.5	194.1	134.0	155.9	111.2	91.8	66.4	75.3	12.5
Total hardwoods	10338.7	886.1	1295.6	1527.2	1373.8	1432.7	1175.4	861.5	611.4	967.9	207.1
All species	19425.5	1564.4	2495.2	2942.3	2926.0	2862.8	2254.9	1588.3	1055.1	1497.7	238.9

Table 13—Volume of growing stock in the saw-log portion of sawtimber¹ trees on timberland by species and diameter class, Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)							
		9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Million cubic feet-----									
Longleaf-slash pines	831.1	170.7	224.4	188.0	136.6	73.2	25.5	12.7	...
Shortleaf-loblolly pine	5326.7	934.0	1121.1	1088.6	825.5	561.7	355.5	420.6	19.7
Other yellow pines	157.6	9.8	19.8	24.5	20.4	23.4	26.0	32.3	1.4
Cypress	82.2	7.3	13.9	7.3	8.2	9.9	4.4	23.0	8.2
Other softwoods	25.9	9.0	5.6	5.2	3.8	1.8	0.5	...	...
Total softwoods	6423.6	1130.9	1384.9	1313.6	994.4	670.0	411.9	488.6	29.3
Select white oaks	558.1	...	94.7	117.1	109.4	82.9	54.1	92.8	7.1
Select red oaks	429.3	...	47.9	66.2	77.6	59.8	47.6	105.3	24.9
Other white oaks	314.2	...	68.2	77.8	56.4	29.8	30.0	40.8	11.2
Other red oaks	1490.4	...	245.8	296.4	268.4	201.8	160.3	257.9	59.7
Hickory	413.5	...	87.4	92.7	75.2	55.9	39.8	55.5	7.1
Hard maple	4.6	...	1.8	1.1	0.8	0.4	0.5	...	...
Soft maple	61.1	...	24.2	16.6	7.5	7.1	3.3	2.5	...
Beech	91.9	...	5.1	12.5	17.1	15.8	10.0	28.0	3.4
Sweetgum	741.9	...	165.4	189.7	143.7	94.5	58.9	82.7	6.8
Tupelo-blackgum	324.7	...	79.5	95.8	75.2	40.7	17.8	15.1	0.6
Ash	143.9	...	27.6	29.4	25.5	22.3	17.6	16.7	4.8
Cottonwood-aspen	104.3	...	2.4	4.1	6.5	10.2	11.6	31.4	38.2
Basswood	12.8	...	1.1	4.5	1.1	1.2	1.0	3.8	...
Yellow-poplar	331.9	...	44.1	62.7	64.3	51.4	30.3	65.9	13.2
Black walnut	3.7	...	0.4	0.8	1.0	0.9	0.7	...	...
Other hardwoods	537.7	...	96.5	126.3	95.4	81.0	59.6	67.1	11.9
Total hardwoods	5564.1	...	992.0	1193.6	1024.9	755.8	543.2	865.6	188.9
All species	11987.7	1130.9	2376.9	2507.1	2019.3	1425.8	955.1	1354.2	218.3

¹ That part of the bole of sawtimber trees between a 1-foot stump and saw-log top, including the portion of the forks large enough to contain a saw log.

Table 14—Volume of sawtimber on timberland by species and diameter class, Mississippi, 1987

Species	Diameter class (inches at breast height)								
	All classes	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Million board feet-----									
Longleaf-slash pines	5022.9	918.2	1329.5	1173.5	878.0	473.1	165.8	84.7	...
Shortleaf-loblolly pine	32959.9	5135.0	6664.0	6796.5	5305.5	3671.1	2372.7	2874.6	140.5
Other yellow pines	1004.5	52.5	115.2	153.0	131.2	154.7	173.3	214.5	10.0
Cypress	471.2	37.0	74.6	43.9	45.3	57.8	26.1	135.3	51.3
Other softwoods	138.7	44.4	29.9	28.5	22.1	11.2	2.6	...	...
Total softwoods	39597.1	6187.0	8213.1	8195.4	6382.1	4367.9	2740.5	3309.2	201.8
Select white oaks	3469.2	...	523.5	694.8	677.7	532.3	357.5	632.8	50.6
Select red oaks	2670.4	...	263.0	388.2	466.9	378.9	304.8	700.5	168.2
Other white oaks	1861.9	...	365.7	445.4	336.9	184.5	186.6	267.1	75.7
Other red oaks	8956.9	...	1336.5	1703.4	1606.5	1247.5	1014.0	1658.6	390.5
Hickory	2564.5	...	489.8	556.5	471.1	357.9	261.7	376.3	51.1
Hard maple	28.1	...	11.1	6.9	4.8	2.0	3.2	...	...
Soft maple	360.3	...	135.2	98.9	46.8	44.5	19.5	15.5	...
Beech	597.5	...	29.3	76.3	107.8	106.1	65.9	190.5	21.5
Sweetgum	4429.1	...	919.0	1108.1	878.7	581.6	374.2	527.9	39.6
Tupelo-blackgum	1784.6	...	414.2	514.9	425.5	232.7	102.1	92.0	3.2
Ash	836.6	...	153.0	169.6	151.5	136.7	107.5	92.1	26.2
Cottonwood-aspen	685.1	...	13.8	23.7	41.6	62.8	75.4	211.6	256.2
Basswood	81.4	...	6.9	27.9	6.1	8.1	6.4	26.0	...
Yellow-poplar	2023.1	...	247.9	371.5	391.5	316.4	188.4	424.3	83.1
Black walnut	22.8	...	2.0	4.8	5.8	5.6	4.6	...	...
Other hardwoods	3241.4	...	538.1	749.0	574.3	505.2	372.7	430.9	71.3
Total hardwoods	33612.8	...	5448.7	6940.0	6193.7	4702.5	3444.4	5646.1	1237.2
All species	73209.9	6187.0	13661.9	15135.4	12575.9	9070.4	6185.0	8955.4	1439.0

Table 15—Volume of growing stock and sawtimber on timberland by county and species group, Mississippi, 1987

County	Growing stock						Sawtimber					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine	Other	Soft ¹	Hard ²	Pine		Other	Soft ¹	Hard ²		
											Planted	Natural	Planted	Natural
-----Million cubic feet-----						-----Million board feet-----						
Adams	259.9	...	44.5	0.7	128.2	86.5	1060.5	...	256.0	3.8	446.2	354.4
Alcorn	127.4	9.9	31.1	0.7	16.5	69.3	381.6	33.3	116.0	1.1	23.8	207.5
Amite	523.7	...	343.6	...	48.3	131.8	2271.1	...	1668.5	...	100.4	502.2
Attala	373.7	21.4	148.3	2.4	81.7	119.8	1254.3	61.9	655.3	2.5	182.9	351.8
Benton	236.6	25.2	52.2	1.2	33.7	124.2	916.4	57.8	277.8	2.9	120.4	457.6
Bolivar	85.6	...	...	2.4	62.4	20.8	351.4	...	...	11.6	264.9	74.8
Calhoun	175.4	65.1	36.8	3.4	17.0	53.1	536.9	211.3	157.1	8.2	21.2	139.1
Carroll	234.9	14.6	74.1	1.7	47.2	97.3	794.9	59.9	244.5	5.3	117.1	368.0
Chickasaw	161.8	25.8	51.9	1.7	25.2	57.2	572.0	86.0	232.4	3.8	50.6	199.1
Choctaw	251.2	25.4	132.7	0.7	30.1	62.4	930.6	127.7	571.4	1.5	59.9	170.1
Claiborne	324.2	15.6	20.2	1.1	145.5	141.8	1410.2	95.4	114.4	3.3	564.4	632.8
Clarke	327.7	19.1	150.3	0.1	54.6	103.6	1075.8	7.6	615.7	...	144.2	308.3
Clay	124.7	...	37.7	0.5	21.2	65.3	441.9	...	157.9	...	57.3	226.6
Coahoma	94.9	...	...	5.6	52.5	36.9	408.4	...	...	34.2	209.4	164.7
Copiah	437.6	34.0	176.6	4.4	83.2	139.3	1797.4	139.2	859.9	16.7	254.4	527.1
Covington	149.8	0.5	39.4	3.2	43.6	63.2	598.4	2.4	196.9	13.4	138.0	247.7
De Soto	123.6	2.8	1.9	2.2	41.3	75.4	506.8	2.1	6.0	8.7	165.9	324.1
Forrest	232.7	37.9	125.8	...	35.8	33.2	820.0	144.8	477.6	...	92.3	105.4
Franklin	648.9	...	466.0	...	65.8	117.1	3240.2	...	2657.2	...	162.5	420.5
George	191.2	23.8	71.4	6.4	56.7	32.9	593.2	22.6	267.9	33.0	153.4	116.3
Greene	384.9	97.1	138.8	0.3	61.0	87.8	1216.5	232.5	619.7	...	118.0	246.3
Grenada	169.9	32.8	43.3	1.2	34.3	58.3	585.4	85.6	172.9	2.5	94.3	230.1
Hancock	134.9	29.1	67.0	3.2	25.2	10.5	397.8	76.2	223.7	2.4	69.3	26.2
Harrison	203.4	4.5	153.9	2.6	31.6	10.7	703.9	6.9	604.4	6.0	61.7	24.9
Hinds	287.2	8.0	70.7	2.8	75.0	130.7	1145.8	25.9	342.2	13.5	226.9	537.2
Holmes	281.3	14.1	47.7	2.0	95.3	122.2	879.1	58.5	151.4	2.6	273.7	392.9
Humphreys ³	113.5	...	...	...	28.9	84.6	366.9	...	...	...	89.5	277.4
Issaquena	146.8	...	...	3.3	83.8	59.8	614.4	...	...	18.3	316.6	279.5
Itawamba	281.8	29.2	84.2	1.8	64.0	102.6	953.9	107.3	362.5	11.0	175.2	297.9
Jackson	311.6	12.0	117.7	14.0	128.4	39.5	972.5	27.6	458.2	37.3	307.3	142.2
Jasper	308.3	21.4	154.4	0.7	42.4	89.4	1108.7	28.6	757.4	2.2	75.3	245.2
Jefferson	274.9	13.1	74.0	1.5	80.5	105.8	1086.1	67.1	387.4	3.8	250.4	377.5
Jefferson Davis	88.2	2.1	45.8	...	25.2	15.1	295.4	...	180.6	...	75.1	39.8
Jones	356.3	21.3	210.1	...	53.3	71.6	1369.0	92.1	920.1	...	138.5	218.3
Kemper	390.1	46.0	206.9	1.0	71.1	65.2	1553.1	156.5	1011.7	3.0	153.6	228.2
Lafayette	383.4	39.0	164.0	2.7	46.1	131.7	1318.7	97.1	646.3	3.3	116.6	455.4
Lamar	179.8	32.3	75.6	...	52.8	19.2	534.5	43.3	306.1	...	141.5	43.6
Lauderdale	589.7	6.7	316.1	0.4	96.3	170.3	2416.7	21.5	1567.8	1.7	271.3	554.5
Lawrence	230.3	0.3	132.3	...	34.2	63.5	915.4	...	563.1	...	88.2	264.1
Leake	288.1	11.5	129.9	3.2	40.4	103.2	1137.8	33.3	611.9	18.0	78.8	395.8
Lee	80.4	15.2	11.4	...	10.4	43.5	220.5	13.1	54.2	...	17.9	135.3
Lincoln	277.6	6.1	139.6	...	61.1	70.7	1016.5	10.7	597.4	...	169.8	238.5
Lowndes	168.8	14.7	27.5	5.9	41.8	78.9	588.0	36.4	148.7	30.6	92.0	280.3
Madison	200.0	2.2	64.5	6.1	39.9	87.3	710.8	7.4	271.6	20.5	114.3	297.1
Marion	244.4	2.3	132.7	...	45.4	64.0	900.5	...	582.0	...	109.5	209.1
Marshall	237.8	68.2	23.1	3.9	68.3	74.3	810.2	226.7	114.3	4.0	210.4	254.7

Table 15—Volume of growing stock and sawtimber on timberland by county and species group, Mississippi, 1987 — Continued

County	Growing stock						Sawtimber					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
-----Million cubic feet-----												
Monroe	276.9	21.0	54.8	0.8	78.2	122.1	844.7	38.8	252.2	...	174.4	379.3
Montgomery	113.6	...	58.1	0.3	18.1	37.0	360.0	...	206.3	1.6	36.9	115.2
Neshoba	275.0	0.7	123.0	0.7	47.7	102.9	1082.0	3.6	623.4	1.7	110.5	342.7
Newton	283.3	30.7	114.6	...	42.3	95.6	1050.1	118.8	502.2	...	84.8	344.3
Noxubee	307.7	36.1	137.5	11.1	21.2	101.8	1320.2	167.0	761.5	35.1	59.5	297.0
Oktibbeha	212.2	19.1	87.2	2.4	25.6	77.8	860.4	82.2	423.4	2.8	84.7	267.4
Panola	178.0	58.8	1.3	1.7	48.6	67.7	589.0	223.5	...	1.4	159.4	204.8
Pearl River	236.6	51.8	83.2	...	68.4	33.2	739.6	104.9	355.2	...	189.9	89.6
Perry	388.6	55.0	207.2	0.9	75.4	50.1	1432.0	116.5	1009.0	6.0	215.6	84.9
Pike	188.5	...	105.0	...	38.0	45.5	775.9	...	474.2	...	125.7	176.0
Pontotoc	107.6	6.1	32.9	1.5	19.0	48.1	291.1	11.4	139.5	1.6	22.0	116.6
Prentiss	140.6	7.7	39.7	2.0	25.6	65.6	454.4	16.8	164.5	0.8	50.5	221.9
Quitman ⁴	100.8	...	...	4.4	64.3	32.0	419.1	...	...	24.3	274.4	120.3
Rankin	464.0	1.6	227.6	1.0	78.0	155.8	1884.4	3.4	1104.5	3.4	168.5	604.6
Scott	369.6	...	220.2	0.5	42.2	106.8	1472.1	...	1035.0	2.4	79.7	355.0
Sharkey	96.0	...	...	...	21.7	74.4	437.7	...	...	...	94.6	343.1
Simpson	221.6	4.1	129.4	...	35.6	52.5	776.7	0.9	511.6	...	63.2	201.0
Smith	404.9	11.9	266.9	0.3	46.6	79.1	1882.1	68.9	1420.8	1.3	123.9	267.2
Stone	205.8	30.5	120.3	1.3	34.9	18.9	758.9	81.8	575.1	0.8	44.5	56.7
Sunflower ⁵	124.3	...	...	7.8	72.5	44.0	464.8	...	...	38.2	279.0	147.7
Tallahatchie	150.4	...	8.7	22.9	58.7	60.0	541.8	...	28.0	100.5	180.6	232.8
Tate	67.1	5.5	7.3	0.8	20.7	32.9	227.9	21.2	27.8	1.3	55.9	121.8
Tippah	185.0	32.3	45.4	0.4	33.5	73.2	533.3	66.0	162.5	2.0	87.9	215.0
Tishomingo	214.3	40.4	65.9	0.5	31.9	75.7	616.2	115.5	209.6	1.7	91.9	197.5
Union	103.8	0.4	31.4	0.8	36.4	34.8	336.8	...	114.6	...	97.6	124.7
Walthall	97.4	...	31.3	0.9	45.1	20.2	368.1	...	143.8	5.2	149.6	69.5
Warren	367.9	...	7.4	0.2	189.0	171.4	1709.7	...	44.4	...	873.8	791.6
Wayne	406.8	36.7	219.9	0.4	63.7	86.1	1561.3	174.1	964.1	1.8	162.3	258.8
Webster	105.4	5.4	42.8	1.4	7.0	48.7	350.2	5.7	197.8	5.4	23.2	118.1
Wilkinson	384.6	3.9	163.9	4.9	100.8	111.2	1682.3	4.8	901.2	21.3	324.7	430.3
Winston	381.0	31.5	193.2	0.4	28.1	127.7	1487.7	92.0	937.7	1.7	59.4	397.0
Yalobusha	212.3	34.1	75.5	2.7	26.3	73.7	811.1	149.4	334.1	4.6	61.4	261.5
Yazoo	354.7	...	0.5	5.9	158.0	190.3	1308.0	...	1.9	12.4	548.9	744.8
All counties	19425.5	1375.1	7537.8	173.9	4230.2	6108.5	73209.9	4173.1	34814.1	609.9	12323.4	21289.4

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

³ Leflore included in Humphreys.

⁴ Tunica included in Quitman.

⁵ Washington included in Sunflower.

Table 16—Volume of timber on timberland by class of timber and species group, Mississippi, 1987

Class of timber	All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²
		Planted	Natural			
----- Million cubic feet -----						
Sawtimber trees:						
Saw-log portion	11987.7	711.1	5604.3	108.1	2065.3	3498.7
Upper-stem portion	1851.0	105.8	664.6	14.9	405.3	660.4
Total	13838.7	816.9	6268.9	123.0	2470.6	4159.1
Poletimber trees	5586.8	558.1	1268.8	50.9	1759.5	1949.4
All growing-stock trees	19425.5	1375.1	7537.8	173.9	4230.2	6108.5
Rough trees:						
Sawtimber size	1430.3	16.9	162.5	20.5	455.5	774.9
Poletimber size	1029.2	31.5	72.4	6.2	341.0	578.1
Total	2459.6	48.4	234.9	26.7	796.5	1353.0
Rotten trees:						
Sawtimber size	379.2	0.3	7.2	6.3	137.8	227.5
Poletimber size	33.0	...	0.2	...	17.2	15.5
Total	412.2	0.3	7.5	6.3	155.0	243.0
Salvable dead trees:						
Sawtimber size	119.9	9.7	77.2	1.9	13.3	17.9
Poletimber size	79.7	5.6	43.9	1.3	5.2	23.7
Total	199.6	15.3	121.1	3.2	18.5	41.5
All classes	22496.8	1439.1	7901.3	210.1	5200.3	7746.1

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 17—Volume of live trees and growing stock on timberland by ownership class and species group, Mississippi, 1987

Ownership class	Live trees						Growing stock					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine			Soft ¹	Hard ²		Pine			Soft ¹	Hard ²
		Planted	Natural	Other				Planted	Natural	Other		
----- Million cubic feet -----												
National forest	2168.7	143.2	1175.8	4.9	282.0	562.8	1994.8	140.6	1154.0	3.9	237.8	458.5
Other public	1227.1	44.9	384.4	30.0	343.0	424.7	1069.6	43.1	376.2	26.8	277.3	346.0
Forest industry	3340.2	604.6	1102.8	20.3	763.2	849.3	2952.3	581.7	1070.5	18.9	621.4	659.7
Forest industry-leased	189.0	11.5	74.7	0.7	24.6	77.4	173.7	10.8	72.1	0.7	21.9	68.2
Other private	15372.3	619.5	5042.5	151.0	3769.0	5790.4	13235.2	598.8	4865.0	123.5	3071.8	4576.1
All ownerships	22297.2	1423.8	7780.2	206.9	5181.8	7704.6	19425.5	1375.1	7537.8	173.9	4230.2	6108.5

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 18—Average net annual growth of growing stock and sawtimber on timberland by county and species group, Mississippi, 1987

County	Growing stock						Sawtimber							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard ²
-----Million cubic feet-----						-----Million board feet-----								
Adams	14.1	...	2.1	...	6.9	5.1	63.2	...	16.1	0.2	27.9	19.0		
Alcorn	7.0	1.1	2.0	0.1	0.6	3.3	29.4	4.1	9.9	...	1.4	14.0		
Amite	20.6	0.7	14.7	...	0.9	4.3	115.6	1.9	91.7	...	2.6	19.5		
Attala	22.2	2.3	10.0	0.2	3.1	6.5	90.4	8.2	49.1	0.5	9.8	22.7		
Benton	6.8	1.3	0.9	0.1	0.8	3.7	34.6	5.8	5.2	0.2	3.0	20.5		
Bolivar	2.1	...	...	0.2	1.0	0.9	10.1	...	...	0.8	5.7	3.7		
Calhoun	14.0	2.4	6.9	0.1	1.0	3.6	59.1	11.3	34.9	0.7	2.0	10.2		
Carroll	11.7	1.0	4.9	0.1	1.7	4.0	50.2	3.2	25.5	0.5	4.6	16.4		
Chickasaw	9.5	2.6	2.5	0.1	1.0	3.4	41.3	8.7	15.4	...	1.9	15.3		
Choctaw	13.8	0.3	9.3	...	1.2	3.0	66.7	0.3	50.2	0.2	3.6	12.4		
Claiborne	16.1	0.9	1.8	0.1	6.3	6.9	87.5	7.7	14.0	0.2	30.0	35.5		
Clarke	15.4	1.9	8.3	...	1.6	3.6	56.7	0.5	38.7	...	3.4	14.2		
Clay	5.5	...	2.0	...	0.8	2.7	27.5	...	10.2	...	3.4	14.0		
Coahoma	1.0	...	...	-0.2	0.5	0.7	6.8	...	...	-1.3	4.0	4.1		
Copiah	24.9	1.4	12.4	0.3	4.2	6.6	110.9	3.3	65.8	0.4	13.7	27.7		
Covington	5.3	...	2.1	0.1	1.3	1.8	19.1	...	11.3	0.4	2.8	4.6		
De Soto	4.5	0.3	0.1	...	1.0	3.2	25.7	0.2	0.4	0.1	8.0	17.1		
Forrest	12.1	1.7	7.2	...	1.5	1.7	49.7	5.0	34.6	...	3.3	6.9		
Franklin	20.7	...	13.0	...	3.3	4.4	116.6	...	88.2	...	7.6	20.8		
George	8.6	2.9	3.5	...	1.6	0.6	24.2	2.6	15.1	...	6.0	0.4		
Greene	20.2	3.8	8.9	...	2.4	5.0	74.9	12.8	43.8	-0.1	3.9	14.6		
Grenada	8.3	4.0	1.3	0.1	1.3	1.6	33.1	11.1	7.3	...	3.4	11.3		
Hancock	6.9	1.2	4.7	0.1	0.5	0.4	26.6	3.7	20.2	...	1.5	1.1		
Harrison	8.9	2.1	4.8	0.1	1.3	0.5	30.0	5.3	21.2	0.5	1.9	1.1		
Hinds	12.2	0.5	2.3	...	3.0	6.3	60.9	1.7	16.4	0.5	12.2	30.2		
Holmes	16.1	1.6	2.9	0.3	4.6	6.7	57.6	5.9	12.7	0.3	13.8	24.9		
Humphreys ³	6.1	...	...	...	1.0	5.2	21.9	...	...	...	4.8	17.2		
Issaquena	5.6	...	...	...	3.1	2.5	21.7	...	...	-0.2	10.7	11.1		
Itawamba	13.1	0.4	5.3	...	2.4	4.9	50.6	1.5	25.7	...	6.6	16.9		
Jackson	7.9	0.8	4.3	0.2	1.7	0.9	31.2	1.6	22.4	-0.1	3.9	3.4		
Jasper	20.0	4.5	8.3	...	1.8	5.3	83.7	14.6	48.5	...	4.5	16.1		
Jefferson	13.9	...	4.2	0.1	4.1	5.4	66.1	0.2	29.2	0.2	14.4	22.2		
Jefferson Davis	7.6	2.6	3.9	...	0.9	0.2	30.6	14.8	9.8	...	3.9	2.1		
Jones	16.6	1.0	8.8	...	2.8	4.0	65.1	2.1	46.1	...	6.6	10.3		
Kemper	19.2	2.1	11.0	0.1	3.2	2.9	87.3	2.8	63.8	0.2	8.5	12.1		
Lafayette	15.9	5.8	3.8	0.1	1.7	4.6	57.8	23.6	14.2	0.2	4.5	15.3		
Lamar	11.4	2.2	6.0	...	2.1	1.1	33.4	2.0	23.1	...	6.5	1.8		
Lauderdale	26.2	0.7	14.4	...	3.6	7.5	135.1	3.8	91.3	...	12.0	28.0		
Lawrence	13.7	0.9	8.9	...	0.9	3.0	62.1	4.3	41.6	...	2.3	13.9		
Leake	17.5	0.5	9.7	0.1	1.5	5.7	83.3	0.1	52.4	0.3	3.5	27.0		
Lee	4.7	1.6	0.9	...	0.5	1.8	13.8	1.4	4.1	...	1.6	6.7		
Lincoln	14.5	0.5	8.6	...	2.4	3.0	70.0	3.1	44.5	-0.2	9.2	13.3		
Lowndes	6.3	1.4	0.7	-0.1	1.3	3.0	33.6	8.5	3.9	-0.2	4.6	16.8		
Madison	10.6	-0.1	5.4	0.1	0.6	4.6	42.9	0.6	22.9	0.1	1.6	17.7		
Marion	14.4	2.0	7.2	...	1.9	3.2	56.5	7.1	33.6	...	3.2	12.6		
Marshall	12.6	4.9	1.4	0.1	2.4	3.7	48.8	19.6	4.9	-0.1	8.6	15.8		

Table 18—Average net annual growth of growing stock and sawtimber on timberland by county and species group, Mississippi, 1987 — Continued

County	Growing stock						Sawtimber							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard ²
----- Million cubic feet -----						----- Million board feet -----								
Monroe	12.0	1.3	2.3	0.1	3.0	5.4	47.3	2.4	13.8	...	8.5	22.6		
Montgomery	6.4	1.5	2.6	...	0.7	1.6	25.0	6.2	12.5	0.1	1.8	4.3		
Neshoba	11.6	...	6.9	...	0.7	4.0	67.4	...	47.5	...	0.3	19.5		
Newton	15.3	0.7	7.5	...	2.2	4.9	72.3	4.0	44.6	...	4.2	19.5		
Noxubee	13.6	1.0	6.3	0.5	1.0	4.8	67.8	7.2	38.0	1.8	3.6	17.3		
Oktibbeha	10.8	1.6	4.9	0.2	0.7	3.3	52.6	10.1	25.9	0.1	3.8	12.7		
Panola	6.1	2.4	0.9	0.1	0.7	2.0	31.8	11.2	6.5	-0.1	5.7	8.5		
Pearl River	17.0	5.1	6.3	...	3.0	2.6	55.3	12.1	26.0	...	9.9	7.3		
Perry	19.4	5.6	8.3	...	2.7	2.7	70.3	15.1	42.1	...	7.5	5.7		
Pike	10.4	...	6.9	...	1.0	2.5	55.0	...	38.5	...	7.2	9.3		
Pontotoc	8.1	1.0	2.4	0.1	1.2	3.5	30.7	3.5	12.5	...	2.7	12.0		
Prentiss	7.2	1.4	2.3	0.1	1.3	2.1	28.6	5.9	11.7	0.1	2.3	8.6		
Quitman ⁴	3.6	...	...	0.1	2.1	1.4	17.5	...	...	0.5	11.1	5.8		
Rankin	17.9	0.2	9.4	...	2.2	6.1	99.7	1.4	62.4	-0.1	5.2	30.8		
Scott	17.9	...	9.7	...	2.8	5.4	76.7	...	52.6	0.1	5.9	18.2		
Sharkey	2.8	...	...	...	0.3	2.5	7.5	...	...	-0.2	-0.4	8.1		
Simpson	14.2	0.9	9.9	...	1.3	2.1	61.2	1.4	47.7	0.1	2.4	9.6		
Smith	20.6	1.6	13.4	...	1.7	3.9	114.9	9.1	84.4	0.2	6.5	14.7		
Stone	9.4	1.5	5.8	-0.1	1.5	0.7	35.0	3.9	26.0	...	1.7	3.4		
Sunflower ⁵	6.1	...	...	0.2	3.5	2.4	25.3	...	...	1.2	15.2	8.9		
Tallahatchie	4.7	0.6	...	0.1	1.8	2.1	23.2	2.7	...	1.4	7.6	11.5		
Tate	4.0	1.0	...	-0.1	1.2	1.9	20.1	6.1	...	...	5.2	8.8		
Tippah	11.6	2.2	3.7	0.1	1.2	4.4	43.6	6.7	14.4	0.6	4.0	17.9		
Tishomingo	11.8	3.8	3.7	...	1.0	3.3	41.4	12.8	14.2	0.1	1.8	12.5		
Union	8.0	...	3.4	...	2.4	2.2	36.1	...	14.8	...	8.1	13.1		
Walthall	6.6	...	3.9	...	1.7	1.0	26.0	...	14.9	...	5.8	5.3		
Warren	11.2	...	0.4	...	4.5	6.3	62.2	...	2.3	-0.2	25.9	34.2		
Wayne	21.1	2.0	12.5	...	2.9	3.6	88.4	4.3	62.4	...	6.3	15.3		
Webster	7.3	1.2	1.9	...	0.5	3.6	31.5	3.9	14.6	...	2.1	10.9		
Wilkinson	18.4	...	7.5	0.3	5.5	5.1	99.4	...	51.5	1.5	20.7	25.7		
Winston	18.7	1.5	9.9	-0.1	1.2	6.2	90.9	10.2	57.6	-0.1	1.7	21.6		
Yalobusha	10.3	3.8	2.6	0.1	1.1	2.8	54.0	18.6	17.1	0.1	4.2	14.0		
Yazoo	15.3	...	...	0.4	7.3	7.6	66.1	...	0.1	0.9	28.2	36.9		
All counties	945.4	107.4	396.9	4.8	159.5	276.8	4189.0	373.7	2136.4	12.6	529.5	1136.9		

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

³ Leflore included in Humphreys.

⁴ Tunica included in Quitman.

⁵ Washington included in Sunflower.

Table 19—Average annual removals of growing stock and sawtimber on timberland by county and species group, Mississippi, 1987

County	Growing stock						Sawtimber					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine			Soft ¹	Hard ²		Pine			Soft ¹	Hard ²
		Planted	Natural	Other				Planted	Natural	Other		
-----Million cubic feet-----						-----Million board feet-----						
Adams	8.7	...	2.0	...	3.7	2.9	34.0	...	11.2	...	14.0	8.8
Alcorn	4.9	2.3	0.5	...	0.3	1.8	15.0	7.9	1.9	...	0.4	4.9
Amite	16.9	...	14.7	...	0.6	1.6	79.8	...	70.7	...	2.6	6.5
Attala	22.6	2.2	15.0	0.3	2.1	3.0	85.5	6.9	64.1	1.1	3.4	10.0
Benton	2.3	0.2	0.5	...	0.7	0.9	6.4	...	1.2	...	1.6	3.6
Bolivar	2.1	...	...	...	1.2	0.9	9.2	...	...	...	6.0	3.1
Calhoun	18.2	...	14.0	...	0.9	3.3	73.8	...	60.9	...	1.7	11.2
Carroll	7.5	2.7	2.4	0.2	1.1	1.1	18.8	5.2	8.9	0.7	0.9	3.0
Chickasaw	5.2	...	3.9	...	...	1.2	20.3	...	15.0	...	...	5.3
Choctaw	11.1	...	8.5	...	0.6	2.0	43.0	...	36.9	...	0.9	5.1
Claiborne	8.7	1.4	5.1	...	1.7	0.5	41.6	6.0	26.4	...	6.8	2.4
Clarke	19.4	0.6	12.0	...	3.3	3.5	62.8	0.6	41.0	...	9.4	11.8
Clay	2.8	...	0.5	...	0.5	1.8	13.3	...	2.4	...	2.4	8.5
Coahoma	0.7	...	...	...	0.4	0.3	3.2	...	...	...	2.6	0.6
Copiah	18.8	0.3	13.0	0.3	2.0	3.2	79.4	0.9	58.5	0.5	5.4	14.1
Covington	9.8	...	5.3	...	1.6	3.0	33.8	...	21.9	...	4.2	7.7
De Soto	0.9	...	...	0.2	0.4	0.3	2.3	...	...	0.6	0.7	1.0
Forrest	6.2	0.4	5.7	...	...	0.1	27.3	1.0	26.3	...	...	...
Franklin	18.7	...	15.8	...	1.6	1.3	94.9	...	85.7	...	3.9	5.4
George	15.0	1.9	11.2	1.2	0.2	0.5	55.4	2.8	46.4	5.0	0.6	0.4
Greene	11.7	1.2	8.0	...	1.4	1.0	43.5	2.3	32.8	...	4.7	3.7
Grenada	2.4	1.2	0.4	...	0.1	0.8	5.2	1.3	1.1	...	0.3	2.5
Hancock	2.1	0.3	1.7	...	0.1	...	6.2	0.6	5.6	...	...	...
Harrison	6.3	1.2	5.0	...	0.1	...	24.1	3.0	20.9	...	0.2	...
Hinds	5.4	0.5	1.9	...	0.3	2.7	26.1	2.6	9.0	...	1.2	13.3
Holmes	7.3	2.1	1.5	0.1	0.8	2.7	20.0	4.6	4.3	...	1.4	9.6
Humphreys ³	1.2	...	...	...	0.3	0.9	3.6	...	...	...	1.1	2.5
Issaquena	3.8	...	...	...	1.9	1.9	19.9	...	...	...	7.2	12.7
Itawamba	12.5	...	7.4	...	1.6	3.4	32.6	...	22.5	...	2.9	7.2
Jackson	10.5	1.2	7.0	...	1.3	1.0	46.7	2.4	33.8	...	7.0	3.5
Jasper	23.2	2.5	15.4	...	1.4	3.9	99.1	7.7	73.6	...	3.1	14.7
Jefferson	10.1	0.2	6.5	...	1.5	1.9	48.7	0.5	37.0	...	3.7	7.5
Jefferson Davis	8.6	2.2	6.0	...	0.2	0.2	19.4	2.4	16.4	...	0.3	0.3
Jones	17.8	0.7	12.5	...	2.7	1.9	86.4	3.1	69.5	...	8.2	5.6
Kemper	20.2	0.1	12.1	...	3.8	4.3	71.8	...	54.5	...	8.3	9.0
Lafayette	3.3	1.6	0.7	0.1	0.3	0.6	9.3	5.3	2.0	0.2	0.2	1.7
Lamar	4.5	1.2	3.0	...	...	0.3	10.2	...	9.6	...	...	0.6
Lauderdale	17.0	0.2	12.5	...	1.4	2.9	60.1	0.7	48.5	...	2.1	8.8
Lawrence	13.4	1.1	9.7	...	0.8	1.8	40.1	2.3	29.5	...	2.5	5.7
Leake	18.1	...	13.1	...	0.8	4.3	71.2	...	54.3	...	1.4	15.5
Lee	2.1	...	0.9	...	0.2	1.0	8.8	...	3.5	...	1.6	3.7
Lincoln	7.7	...	6.2	...	0.4	1.1	34.1	...	28.7	...	1.8	3.6
Lowndes	5.3	0.9	0.7	0.7	1.3	1.6	15.2	2.2	2.0	2.7	3.1	5.3
Madison	8.5	0.6	5.0	...	0.6	2.3	30.8	1.8	17.6	...	2.3	9.1
Marion	5.8	...	2.4	...	1.2	2.2	21.5	...	7.8	...	4.5	9.2
Marshall	7.8	1.5	2.8	0.1	1.6	1.7	28.2	2.6	9.6	0.4	7.3	8.3

Table 19—Average annual removals of growing stock and sawtimber on timberland by county and species group, Mississippi, 1987 — Continued

County	Growing stock						Sawtimber							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard ²
-----Million cubic feet-----						-----Million board feet-----								
Monroe	12.6	...	7.3	...	2.0	3.3	50.7	...	35.2	...	5.5	10.0		
Montgomery	9.6	2.6	3.5	...	0.3	3.2	35.0	11.3	13.7	...	0.3	9.7		
Neshoba	16.3	...	11.9	...	2.1	2.3	81.1	...	65.2	...	7.8	8.2		
Newton	14.5	0.4	8.2	...	2.6	3.3	57.8	0.8	40.4	...	6.7	9.8		
Noxubee	6.0	0.5	2.9	0.1	0.6	1.9	28.3	2.4	14.9	0.7	2.6	7.6		
Oktibbeha	5.6	1.1	1.5	...	0.5	2.5	24.1	3.4	7.3	...	2.7	10.6		
Panola	2.7	0.7	0.3	...	0.4	1.3	8.6	1.7	1.6	...	0.7	4.5		
Pearl River	9.3	2.6	5.3	0.1	1.1	0.3	26.8	8.1	13.7	0.3	3.8	0.9		
Perry	18.2	1.7	13.7	...	0.9	1.9	73.3	5.2	60.5	...	2.7	4.9		
Pike	5.9	...	4.0	...	0.6	1.3	23.7	...	17.0	...	1.8	4.9		
Pontotoc	9.1	0.2	4.9	...	0.6	3.4	33.4	...	20.1	...	2.0	11.2		
Prentiss	8.0	5.2	0.7	...	1.1	1.0	29.3	19.6	2.1	...	3.5	4.0		
Quitman ⁴	0.6	...	...	...	0.5	0.1	3.4	...	...	...	3.1	0.2		
Rankin	12.9	0.2	10.6	...	0.2	1.9	45.7	0.6	37.7	...	0.5	6.9		
Scott	16.4	0.5	12.4	...	0.2	3.4	78.2	0.7	65.8	...	0.4	11.3		
Sharkey	1.3	...	...	...	0.2	1.1	7.1	...	...	...	1.1	6.0		
Simpson	18.5	...	14.1	0.1	1.5	2.9	72.8	...	58.3	0.3	2.8	11.4		
Smith	21.7	0.7	14.0	...	2.5	4.5	85.0	3.1	60.3	...	8.0	13.5		
Stone	8.3	0.6	6.6	...	0.8	0.3	28.0	0.7	24.1	...	2.3	0.9		
Sunflower ⁵	1.9	...	...	1.2	0.1	0.6	8.1	...	...	5.8	0.7	1.6		
Tallahatchie	1.0	...	0.1	...	0.4	0.5	3.5	...	0.6	...	1.1	1.8		
Tate	2.5	...	...	...	1.6	0.9	7.0	...	...	...	5.2	1.8		
Tippah	7.9	1.3	3.1	0.1	0.9	2.5	25.8	2.8	10.9	0.6	3.3	8.3		
Tishomingo	8.4	1.8	3.9	...	1.1	1.6	23.1	4.2	11.0	...	3.3	4.7		
Union	4.0	...	2.8	...	...	1.1	10.1	...	6.7	...	...	3.4		
Walthall	7.4	...	6.4	...	0.2	0.7	28.3	...	24.2	...	0.4	3.7		
Warren	8.0	...	...	0.1	4.0	4.0	39.2	...	...	0.3	19.8	19.1		
Wayne	22.8	0.5	15.0	...	2.4	5.0	84.2	0.8	63.4	...	2.8	17.2		
Webster	17.3	3.2	4.6	0.1	1.1	8.2	60.3	8.7	18.5	...	3.6	29.5		
Wilkinson	16.9	...	9.7	0.4	3.8	3.0	81.9	...	53.5	1.5	13.2	13.7		
Winston	15.2	4.1	8.6	...	0.1	2.4	61.9	13.7	38.6	...	...	9.6		
Yalobusha	8.2	2.2	3.5	0.1	0.6	1.8	30.0	5.8	16.1	...	2.1	6.0		
Yazoo	4.8	...	0.1	...	1.5	3.2	21.8	...	0.5	...	6.9	14.4		
All counties	761.2	62.6	452.3	5.5	85.9	154.9	2959.9	170.6	1955.2	20.8	264.9	548.3		

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottownwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

³ Leflore included in Humphreys.

⁴ Tunica included in Quitman.

⁵ Washington included in Sunflower.

Table 20—Average net annual growth and average annual removals of growing stock on timberland by species, Mississippi, 1987

Species	Growth	Removals
- - - - Million cubic feet - - - -		
Yellow pines	504.3	514.9
Other softwoods	4.8	5.5
Total softwoods	509.1	520.4
Select white-red oaks	75.1	42.8
Other white-red oaks	147.6	85.3
Hickory	25.4	15.7
Hard maple	0.6	0.2
Sweetgum	73.1	38.7
Ash-walnut-black cherry	14.4	5.7
Yellow-poplar	28.4	13.7
Other hardwoods	71.8	38.8
Total hardwoods	436.3	240.8
All species	945.4	761.2

Table 21—Average net annual growth and average annual removals of sawtimber on timberland by species, Mississippi, 1987

Species	Growth	Removals
- - - - Million board feet - - - -		
Yellow pines	2510.1	2125.8
Other softwoods	12.6	20.8
Total softwoods	2522.7	2146.6
Select white-red oaks	341.7	168.5
Other white-red oaks	606.4	294.9
Hickory	101.3	59.5
Hard maple	1.2	0.6
Sweetgum	203.4	88.0
Ash-walnut-black cherry	46.7	12.8
Yellow-poplar	125.8	60.5
Other hardwoods	239.9	128.5
Total hardwoods	1666.3	813.3
All species	4189.0	2959.9

Table 22—Average annual mortality of growing stock and sawtimber on timberland by species, Mississippi, 1987

Species	Growing stock	Sawtimber
- - Million cubic feet - - Million board feet - -		
Yellow pines	91.1	270.7
Other softwoods	2.0	3.2
Total softwoods	93.1	273.9
Select white-red oaks	6.6	18.0
Other white-red oaks	22.5	58.3
Hickory	5.0	21.5
Sweetgum	12.8	32.9
Ash-walnut-black cherry	3.0	6.7
Yellow-poplar	1.2	5.7
Other hardwoods	25.6	76.4
Total hardwoods	76.7	219.5
All species	169.8	493.4

Table 23—Average net annual growth and average annual removals of growing stock on timberland by ownership class and species group, Mississippi, 1987

Ownership class	Growth						Removals					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
-----Million cubic feet-----												
National forest	67.7	8.6	35.1	0.1	9.2	14.7	55.9	2.6	48.2	0.1	1.7	3.3
Other public	28.1	0.8	12.2	0.3	5.0	9.7	15.8	0.1	6.6	0.2	3.2	5.7
Forest industry	183.9	44.9	78.3	0.9	25.2	34.6	223.2	30.7	124.0	1.3	25.2	42.0
Forest industry-leased	7.4	0.6	3.0	...	0.8	2.9	10.2	...	8.2	...	0.2	1.8
Other private	658.2	52.3	268.3	3.5	119.2	214.9	456.1	29.3	265.3	3.8	55.6	102.1
All ownerships	945.4	107.4	396.9	4.8	159.5	276.8	761.2	62.6	452.3	5.5	85.9	154.9

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 24—Average net annual growth and average annual removals of sawtimber on timberland by ownership class and species, Mississippi, 1987

Ownership class	Growth						Removals					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine			Soft ¹	Hard ²		Pine			Soft ¹	Hard ²
		Planted	Natural	Other				Planted	Natural	Other		

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

**Table 25—Volume of sawtimber on timberland by species and tree grade,
Mississippi, 1987**

Species	All grades	Grade 1	Grade 2	Grade 3	Grade 4
----- Million board feet -----					
Yellow pines	38987.2	5889.1	6701.2	26397.0	...
Cypress	471.2	72.6	114.4	284.1	...
Redcedar	136.4	136.4	...	...	...
Other softwoods	2.3	2.3	...	...	...
Total softwoods	39597.1	6100.4	6815.6	26681.1	...
Select white-red oaks	6139.6	763.1	1601.4	2695.3	1079.8
Other white-red oaks	10818.7	403.1	1632.0	4731.0	4052.6
Hickory	2564.5	171.2	485.1	1444.6	463.5
Hard maple	28.1	...	...	12.8	15.3
Sweetgum	4429.1	375.4	888.5	2256.0	909.1
Tupelo and blackgum	1784.6	105.6	514.3	1000.6	164.2
Ash-walnut-black cherry	982.3	168.6	275.0	471.6	67.1
Yellow-poplar	2023.1	240.2	422.6	915.0	445.3
Other hardwoods	4842.8	663.6	965.2	1899.4	1314.6
Total hardwoods	33612.8	2890.9	6784.2	15426.4	8511.3
All species	73209.9	8991.3	13599.8	42107.5	8511.3

SUPPLEMENTAL TABLES 26–36

**Table 26—Area of timberland by stand age, forest type group and type of regeneration,
Mississippi, 1987**

Stand age class	Pine		Oak-pine		Other hardwood types	
	Artificial	Natural	Artificial	Natural	Artificial	Natural
----- Thousand acres -----						
1-10	715.8	266.7	394.2	146.9	355.6	375.1
11-20	274.2	248.2	88.8	232.1	12.4	795.4
21-30	218.9	48.9	30.1	4.9	...	35.9
31-40	79.7	118.1	17.3	20.8	6.1	66.7
41-50	30.8	100.2	6.8	34.9	4.8	80.3
>50	...	35.9	5.0	17.4	7.8	28.6
Mixed	218.3	2416.6	210.5	2313.4	93.3	6816.4
Total	1537.7	3234.5	752.6	2770.3	480.1	8198.3

Table 27—Volume of softwood growing stock on timberland by forest type, Mississippi, 1987

County	Total	Forest type group							
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-Gum Cypress	Elm-ash- Cottonwood
		Planted	Natural	Planted	Natural				
----- Million cubic feet -----									
Adams	45.2	...	...	...	8.4	16.7	20.1	...	...
Alcorn	41.7	...	...	9.7	16.2	7.5	8.3	...	...
Amite	343.6	...	...	...	270.7	42.6	27.9	2.4	...
Attala	172.1	...	...	14.2	102.6	35.5	19.1	0.7	...
Benton	78.6	...	...	19.3	33.0	18.3	8.1	...	...
Bolivar	2.4	...	...	...	...	...	...	0.9	1.5
Calhoun	105.3	...	...	44.6	14.1	38.8	7.8	...	...
Carroll	90.4	...	...	14.1	39.7	18.2	17.3	1.1	...
Chickasaw	79.4	...	...	16.3	38.1	21.0	4.0	...	...
Choctaw	158.7	...	...	17.7	83.3	44.5	13.2	...	...
Claiborne	36.9	...	...	15.6	...	5.8	15.5	...	...
Clarke	169.5	...	...	15.7	93.6	33.1	21.0	6.2	...
Clay	38.2	...	...	...	23.4	12.5	2.4	...	...
Coahoma	5.6	...	...	...	...	...	...	5.1	0.5
Copiah	215.0	...	...	27.7	89.0	62.0	23.1	13.2	...
Covington	43.1	...	...	...	1.0	32.6	3.3	6.3	...
De Soto	6.9	...	...	...	...	2.8	2.5	...	1.6
Forrest	163.7	16.8	43.9	8.5	34.2	53.6	1.9	4.7	...
Franklin	466.0	...	...	...	360.9	86.3	17.9	1.0	...
George	101.6	21.2	3.4	...	39.3	16.6	11.1	10.0	...
Greene	236.2	58.2	26.1	33.0	31.8	71.8	6.3	9.0	...
Grenada	77.2	...	...	27.1	25.1	14.5	10.5	...	...
Hancock	99.2	24.5	22.2	2.5	22.6	18.4	...	9.0	...
Harrison	161.0	1.4	89.0	3.1	...	54.9	2.7	9.9	...
Hinds	81.5	...	...	8.0	39.8	15.2	17.4	1.3	...
Holmes	63.8	...	...	7.8	17.8	26.0	11.7	0.4	...
Humphreys ¹	...	...	...	...	...	...	...	...	...
Issaquena	3.3	...	...	...	...	...	...	3.3	...
Itawamba	115.2	...	...	25.4	46.9	27.8	12.8	2.2	...
Jackson	143.7	9.1	66.8	3.0	...	43.8	11.4	9.7	...
Jasper	176.5	...	...	14.6	106.9	27.7	20.8	6.6	...
Jefferson	88.6	...	...	12.4	36.4	18.3	19.8	1.7	...
Jefferson Davis	47.9	...	...	2.1	33.8	6.5	5.0	0.6	...
Jones	231.4	20.5	38.0	0.8	74.9	75.3	12.0	9.9	...
Kemper	253.8	...	...	44.0	148.9	54.4	1.0	5.4	...
Lafayette	205.7	...	...	30.9	92.3	58.9	22.8	0.9	...
Lamar	107.8	4.7	36.6	22.8	15.0	17.1	7.4	4.1	...
Lauderdale	323.2	...	...	6.7	241.6	44.0	23.2	7.6	...
Lawrence	132.6	...	10.4	0.3	63.9	45.0	3.7	9.4	...
Leake	144.5	...	...	11.3	71.8	36.5	18.0	7.0	...
Lee	26.5	...	...	15.2	...	7.4	3.4	0.6	...
Lincoln	145.7	...	...	1.2	71.3	53.1	16.3	3.8	...
Lowndes	48.1	...	...	13.5	...	19.2	1.7	13.2	0.4
Madison	72.8	...	...	2.2	38.2	26.5	3.0	2.8	...
Marion	135.0	1.8	3.6	...	54.9	55.3	9.6	9.8	...
Marshall	95.2	...	...	50.1	15.3	19.8	6.4	3.6	...

Table 27—Volume of softwood growing stock on timberland by forest type, Mississippi, 1987 — Continued

County	Total	Forest type group							
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-Gum Cypress	Elm-ash- Cottonwood
		Planted	Natural	Planted	Natural				
----- Million cubic feet -----									
Monroe	76.6	...	...	14.6	26.3	17.4	16.3	1.9	...
Montgomery	58.5	...	...	...	26.7	22.5	9.3	...	...
Neshoba	124.4	...	...	...	53.8	47.2	21.0	2.4	...
Newton	145.3	11.4	...	15.0	66.5	37.7	5.7	8.9	...
Noxubee	184.7	...	...	21.3	103.7	45.4	8.0	6.2	...
Oktibbeha	108.8	...	...	19.1	48.6	26.8	11.9	2.4	...
Panola	61.8	...	...	54.7	...	5.8	0.9	0.3	...
Pearl River	135.0	26.4	21.5	22.5	37.1	8.3	13.4	5.7	...
Perry	263.1	20.5	73.3	29.9	60.1	60.2	13.3	5.8	...
Pike	105.0	...	...	...	65.3	32.7	7.1	...	...
Pontotoc	40.4	...	...	6.1	15.2	8.5	9.8	0.9	...
Prentiss	49.4	5.3	...	3.9	22.0	10.5	7.7	...	...
Quitman ²	4.4	...	...	...	...	...	...	4.4	...
Rankin	230.2	...	...	1.6	121.2	80.5	20.0	6.8	...
Scott	220.6	...	...	...	155.1	46.6	15.4	3.6	...
Sharkey	...	...	...	...	...	...	...	...	...
Simpson	133.5	...	...	1.7	97.1	28.4	4.8	1.4	...
Smith	279.2	...	21.4	11.9	173.7	59.6	12.6	...	...
Stone	152.0	13.8	61.3	6.9	27.6	26.5	9.1	6.9	...
Sunflower ³	7.8	...	...	...	...	...	...	7.8	...
Tallahatchie	31.6	...	...	...	...	8.7	0.7	22.2	...
Tate	13.6	...	...	5.5	...	7.3	0.8	...	...
Tippah	78.2	...	...	32.3	30.6	4.2	10.1	1.0	...
Tishomingo	106.7	...	...	36.4	20.9	30.6	17.9	0.9	...
Union	32.6	...	...	...	9.7	12.4	10.6	...	...
Walthall	32.1	...	...	...	16.4	0.2	6.4	9.2	...
Warren	7.5	...	...	...	...	...	7.4	...	0.2
Wayne	257.0	21.5	28.6	11.1	98.8	71.3	15.5	10.2	...
Webster	49.6	...	...	5.4	22.3	16.6	5.4	...	...
Wilkinson	172.6	...	...	3.9	66.6	81.6	13.3	6.8	0.5
Winston	225.2	...	5.2	19.3	103.7	74.7	18.9	3.4	...
Yalobusha	112.2	...	...	25.5	57.1	18.6	10.8	0.3	...
Yazoo	6.4	...	...	...	...	3.2	2.0	1.2	...
All counties	9086.8	257.2	551.4	890.0	4022.5	2280.0	777.0	303.9	4.7

¹ Leflore included in Humphreys.

² Tunica included in Quitman.

³ Washington included in Sunflower.

Table 28—Volume of hardwood growing stock on timberland by forest type, Mississippi, 1987

County	Total	Forest type group							
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-Gum Cypress	Elm-ash- Cottonwood
		Planted	Natural	Planted	Natural				
----- Million cubic feet -----									
Adams	214.7	...	...	...	3.2	12.7	127.9	29.0	42.0
Alcorn	85.8	...	...	1.2	2.0	4.2	66.5	11.8	...
Amite	180.1	...	...	...	38.0	27.3	81.4	33.4	...
Attala	201.5	...	...	0.3	19.6	24.2	78.3	79.1	...
Benton	157.9	...	...	1.1	6.2	18.5	90.5	41.7	...
Bolivar	83.2	...	...	...	...	...	3.2	57.8	22.1
Calhoun	70.1	...	...	6.0	4.0	19.2	40.8	...	...
Carroll	144.5	...	...	1.1	5.5	12.1	90.7	35.0	...
Chickasaw	82.4	...	...	...	6.1	28.3	48.0	...	...
Choctaw	92.5	...	...	0.7	8.1	28.4	54.0	1.3	...
Claiborne	287.3	...	...	0.6	...	0.2	201.6	84.9	...
Clarke	158.2	...	...	...	11.7	17.6	88.4	40.4	...
Clay	86.5	...	...	...	4.3	2.9	54.6	24.7	...
Coahoma	89.4	...	...	...	...	...	...	83.5	5.8
Copiah	222.6	...	...	3.3	11.3	46.3	82.0	79.7	...
Covington	106.8	...	...	...	1.6	24.8	17.2	63.1	...
De Soto	116.7	...	...	...	...	7.0	74.1	35.5	...
Forrest	69.1	...	1.1	1.2	6.4	17.5	6.4	36.4	...
Franklin	182.9	...	...	...	59.3	56.5	44.8	22.3	...
George	89.6	1.0	...	...	3.0	5.8	18.8	60.9	...
Greene	148.8	3.2	4.5	2.2	3.5	47.2	28.3	60.0	...
Grenada	92.6	...	...	1.7	7.2	17.6	43.7	22.5	...
Hancock	35.7	...	0.4	...	2.3	5.6	...	27.4	...
Harrison	42.3	...	1.5	...	...	13.5	4.6	22.7	...
Hinds	205.7	...	...	0.6	15.3	19.8	110.0	59.9	...
Holmes	217.5	...	...	3.3	3.8	21.5	95.6	93.4	...
Humphreys ¹	113.5	...	...	...	...	...	...	113.5	...
Issaquena	143.5	...	...	...	...	...	7.2	136.3	...
Itawamba	166.6	...	...	3.5	7.5	21.7	56.3	77.6	...
Jackson	167.9	...	9.5	...	...	10.8	17.0	130.6	...
Jasper	131.8	...	...	1.8	15.1	18.3	56.0	40.5	...
Jefferson	186.4	...	...	1.2	5.9	12.9	114.1	36.9	15.3
Jefferson Davis	40.3	...	...	...	0.7	2.3	9.9	27.4	...
Jones	124.9	0.8	1.6	0.3	18.9	40.1	25.9	37.4	...
Kemper	136.3	...	...	2.6	26.2	39.5	16.3	51.7	...
Lafayette	177.7	...	...	2.0	17.4	43.9	101.9	12.5	...
Lamar	72.0	...	2.0	2.1	2.2	10.0	23.7	32.0	...
Lauderdale	266.6	...	...	4.5	39.0	41.3	90.2	91.6	...
Lawrence	97.7	...	...	...	8.6	31.1	3.4	54.6	...
Leake	143.6	...	...	...	11.3	21.3	53.1	57.9	...
Lee	53.9	...	...	...	...	10.9	20.2	22.8	...
Lincoln	131.9	...	...	...	11.4	33.7	59.7	27.0	...
Lowndes	120.7	...	...	0.5	...	7.6	9.4	103.2	...
Madison	127.2	...	...	...	3.1	20.3	29.2	74.5	...
Marion	109.4	...	0.2	...	8.2	31.3	26.7	43.0	...
Marshall	142.6	...	...	4.8	5.7	16.4	21.8	85.5	8.4

Table 28—Volume of hardwood growing stock on timberland by forest type, Mississippi, 1987 — Continued

County	Total	Forest type group							
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-Gum Cypress	Elm-ash- Cottonwood
		Planted	Natural	Planted	Natural				
----- Million cubic feet -----									
Monroe	200.3	...	...	4.0	8.5	13.3	116.9	57.7	...
Montgomery	55.1	...	...	...	4.6	13.3	37.2	...	...
Neshoba	150.6	...	...	...	6.4	32.6	52.9	58.8	...
Newton	138.0	0.7	...	0.3	11.3	28.5	19.8	77.3	...
Noxubee	123.0	...	...	4.5	7.3	24.8	18.0	68.5	...
Oktibbeha	103.4	...	...	0.9	10.8	14.9	47.3	29.5	...
Panola	116.3	...	...	7.5	...	8.6	54.0	46.1	...
Pearl River	101.6	3.2	1.3	0.4	5.2	7.7	20.0	63.9	...
Perry	125.5	...	5.9	1.8	9.6	40.7	24.7	42.8	...
Pike	83.5	...	...	...	3.7	46.7	28.9	4.3	...
Pontotoc	67.1	...	...	0.4	2.9	7.9	49.8	6.1	...
Prentiss	91.2	...	...	0.3	3.8	6.7	63.7	16.7	...
Quitman ²	96.4	...	...	...	...	...	...	81.4	14.9
Rankin	233.8	...	...	...	17.3	57.3	75.3	83.9	...
Scott	148.9	...	...	...	20.0	23.1	59.8	45.9	...
Sharkey	96.0	...	...	...	...	...	...	96.0	...
Simpson	88.1	...	...	...	11.7	23.0	18.1	35.3	...
Smith	125.7	...	3.2	1.2	17.9	38.2	51.3	13.9	...
Stone	53.8	...	4.5	1.0	2.1	14.4	13.8	18.0	...
Sunflower ³	116.6	...	...	...	...	...	...	91.7	24.9
Tallahatchie	118.7	...	...	...	...	2.4	51.7	64.6	...
Tate	53.6	...	...	0.8	...	0.2	52.5	...	...
Tippah	106.7	...	...	3.2	7.5	8.2	68.7	16.8	2.5
Tishomingo	107.6	...	...	0.9	5.1	28.1	46.1	27.4	...
Union	71.2	...	...	...	0.8	10.9	55.2	4.4	...
Walthall	65.3	...	...	...	1.3	1.0	18.3	44.7	...
Warren	360.4	...	...	...	...	...	200.9	123.4	36.1
Wayne	149.8	1.0	3.9	2.0	17.2	33.2	41.4	51.2	...
Webster	55.8	...	...	0.4	3.8	14.6	36.9	...	...
Wilkinson	212.0	...	...	2.4	7.0	44.4	108.3	36.2	13.7
Winston	155.8	...	...	0.2	10.0	50.4	54.2	41.0	...
Yalobusha	100.0	...	...	1.7	8.7	13.9	69.1	6.6	...
Yazoo	348.4	...	...	...	...	5.7	209.1	119.2	14.4
All counties	10338.7	9.9	39.6	80.4	607.8	1507.2	4057.0	3836.6	200.2

¹ Leflore included in Humphreys.

² Tunica included in Quitman.

³ Washington included in Sunflower.

Table 29—Volume of softwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, Mississippi, 1987

County	Total	Forest type group							
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-Gum Cypress	Elm-ash- Cottonwood
		Planted	Natural	Planted	Natural				
----- Million cubic feet -----									
Adams	40.1	...	...	...	7.6	14.2	18.3	...	...
Alcorn	27.1	...	...	6.2	10.8	4.8	5.4	...	...
Amite	267.8	...	...	...	212.1	29.3	24.0	2.3	...
Attala	121.7	...	...	7.4	78.8	20.5	14.4	0.6	...
Benton	55.6	...	...	9.5	26.9	12.7	6.5	...	...
Bolivar	2.2	...	...	...	...	...	...	0.8	1.3
Calhoun	63.9	...	...	25.4	12.4	21.8	4.3	...	...
Carroll	52.6	...	...	9.9	18.6	13.8	9.6	0.8	...
Chickasaw	56.0	...	...	6.8	28.4	18.3	2.5	...	...
Choctaw	115.0	...	...	14.9	60.2	34.1	5.9	...	...
Claiborne	33.0	...	...	14.9	...	5.4	12.7	...	...
Clarke	99.9	...	...	0.3	62.3	18.6	13.2	5.6	...
Clay	26.4	...	...	...	14.6	10.3	1.5	...	...
Coahoma	5.0	...	...	...	...	...	...	4.5	0.5
Copiah	163.5	...	...	15.8	70.0	48.3	19.9	9.5	...
Covington	34.2	...	...	...	...	26.9	1.7	5.5	...
De Soto	3.1	...	...	...	...	0.4	1.5	...	1.1
Forrest	103.6	12.1	26.4	3.4	20.3	36.6	1.3	3.6	...
Franklin	403.7	...	...	...	312.2	75.4	15.1	1.0	...
George	54.5	3.7	1.9	...	24.1	6.7	9.3	8.9	...
Greene	144.3	27.0	20.0	14.4	22.1	49.8	3.7	7.3	...
Grenada	48.0	...	...	13.0	15.7	10.5	8.8	...	...
Hancock	53.2	11.8	8.0	0.9	13.4	13.2	...	5.9	...
Harrison	103.3	0.7	52.6	0.7	...	39.8	2.3	7.2	...
Hinds	61.1	...	...	4.3	31.5	12.5	11.7	1.1	...
Holmes	36.1	...	...	6.1	9.3	12.7	8.0	...	...
Humphreys ¹	...	...	...	...	...	...	...	...	...
Issaquena	3.2	...	...	...	...	...	...	3.2	...
Itawamba	78.1	...	...	15.9	33.3	17.8	9.1	2.1	...
Jackson	89.6	4.5	44.1	0.6	...	26.0	7.4	7.1	...
Jasper	124.4	...	...	4.2	87.8	14.5	11.8	6.0	...
Jefferson	72.2	...	...	10.2	28.2	17.0	15.6	1.2	...
Jefferson Davis	30.8	...	...	...	23.0	3.4	3.8	0.5	...
Jones	166.2	13.8	29.5	0.4	48.5	57.3	8.1	8.4	...
Kemper	188.6	...	...	25.7	112.8	44.6	0.6	4.9	...
Lafayette	130.6	...	...	14.0	55.9	40.7	19.3	0.7	...
Lamar	58.5	0.3	24.3	6.7	9.7	9.1	4.6	3.7	...
Lauderdale	250.6	...	...	3.8	186.9	33.7	20.0	6.1	...
Lawrence	91.1	...	1.1	...	44.2	36.0	1.1	8.7	...
Leake	107.4	...	...	5.3	51.2	28.9	15.2	6.7	...
Lee	11.8	...	...	2.8	...	6.9	1.8	0.4	...
Lincoln	100.3	...	...	...	43.2	41.6	11.9	3.7	...
Lowndes	35.3	...	...	5.3	...	16.5	1.4	11.6	0.4
Madison	49.8	...	...	1.2	25.4	18.7	2.2	2.2	...
Marion	94.9	...	2.2	...	34.9	41.2	8.2	8.4	...
Marshall	55.8	...	...	28.6	12.2	9.2	4.9	0.8	...

Table 29—Volume of softwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, Mississippi, 1987 — Continued

County	Total	Forest type group							
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-Gum Cypress	Elm-ash- Cottonwood
		Planted	Natural	Planted	Natural				
----- Million cubic feet -----									
Monroe	47.7	...	...	3.1	18.5	11.6	13.1	1.4	...
Montgomery	35.1	...	...	...	14.5	14.8	5.8	...	...
Neshoba	103.7	...	...	...	42.4	41.3	17.8	2.3	...
Newton	102.6	7.1	...	10.1	47.0	26.8	3.7	7.8	...
Noxubee	148.0	...	...	13.3	84.3	37.8	7.2	5.3	...
Oktibbeha	82.7	...	...	13.6	33.8	24.6	8.8	2.0	...
Panola	36.8	...	...	35.6	...	0.9	...	0.3	...
Pearl River	77.3	6.2	13.6	12.6	26.4	3.3	9.9	5.2	...
Perry	183.8	6.2	60.7	12.6	41.3	48.1	9.7	5.2	...
Pike	74.0	...	...	...	42.6	26.6	4.8	...	...
Pontotoc	26.0	...	...	2.2	11.0	5.4	6.7	0.8	...
Prentiss	32.4	1.6	...	1.8	18.2	5.0	5.8	...	...
Quitman ²	4.0	...	...	...	...	...	...	4.0	...
Rankin	175.4	...	...	0.6	95.7	58.4	15.6	5.2	...
Scott	162.4	...	...	...	113.3	36.0	10.0	3.1	...
Sharkey	...	...	...	...	...	...	...	...	...
Simpson	84.7	...	...	...	64.8	16.4	2.8	0.7	...
Smith	234.1	...	16.5	10.7	143.5	52.7	10.7	...	...
Stone	108.1	5.5	49.9	2.0	20.8	18.3	7.0	4.5	...
Sunflower ³	7.0	...	...	...	...	...	...	7.0	...
Tallahatchie	22.6	...	...	...	...	5.2	0.3	17.2	...
Tate	8.7	...	...	3.7	...	4.8	0.3	...	...
Tippah	41.5	...	...	12.7	17.6	2.7	7.9	0.7	...
Tishomingo	58.2	...	...	20.7	11.4	15.8	10.3	...	...
Union	20.0	...	...	...	7.0	6.7	6.2	...	...
Walthall	23.7	...	...	...	10.6	...	5.0	8.0	...
Warren	7.0	...	...	...	...	...	7.0	...	...
Wayne	180.6	16.7	20.5	7.0	62.4	53.4	11.6	9.1	...
Webster	34.8	...	...	0.7	15.1	15.1	3.8	...	...
Wilkinson	143.4	...	...	1.1	56.5	69.9	10.4	5.3	0.3
Winston	161.1	...	4.7	6.9	85.3	50.5	10.6	3.1	...
Yalobusha	79.8	...	...	17.7	42.1	12.2	7.8	...	...
Yazoo	2.5	...	...	...	...	0.6	0.9	1.1	...
All counties	6423.6	117.2	376.0	466.8	2974.5	1664.7	570.2	250.4	3.7

¹ Leflore included in Humphreys.

² Tunica included in Quitman.

³ Washington included in Sunflower.

Table 30—Volume of hardwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, Mississippi, 1987

County	Total	Forest type group							
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum cypress	Elm-ash- cottonwood
		Planted	Natural	Planted	Natural				
----- Million cubic feet -----									
Adams	126.8	...	...	...	2.4	6.0	74.4	15.7	28.3
Alcorn	40.1	...	...	0.3	...	1.6	32.1	6.2	...
Amite	99.7	...	...	...	19.5	11.3	48.3	20.7	...
Attala	90.3	...	...	...	6.5	11.2	33.3	39.3	...
Benton	94.6	...	...	...	2.4	9.1	50.1	33.0	...
Bolivar	56.3	...	...	...	...	...	2.0	38.3	16.0
Calhoun	27.5	...	...	2.0	1.4	5.9	18.2	...	...
Carroll	77.3	...	...	0.4	1.7	4.8	54.1	16.4	...
Chickasaw	42.0	...	...	...	2.4	12.9	26.8	...	...
Choctaw	39.6	...	...	0.3	1.6	12.9	24.9	...	...
Claiborne	191.7	...	...	...	...	...	140.4	51.3	...
Clarke	75.5	...	...	...	3.1	5.8	40.3	26.3	...
Clay	48.9	...	...	...	1.1	1.4	31.1	15.3	...
Coahoma	59.6	...	...	...	...	...	...	56.0	3.6
Copiah	128.1	...	...	1.3	3.1	22.8	48.6	52.3	...
Covington	64.5	...	...	...	0.8	10.5	9.6	43.6	...
De Soto	78.5	...	...	...	...	4.4	46.7	27.5	...
Forrest	34.1	...	...	0.6	3.1	5.7	4.7	19.9	...
Franklin	94.5	...	...	...	22.5	35.5	18.6	17.9	...
George	46.6	0.4	...	...	0.5	2.7	12.4	30.7	...
Greene	61.6	0.5	0.8	0.4	1.6	16.9	8.4	33.0	...
Grenada	55.7	...	...	0.7	4.6	8.9	23.1	18.5	...
Hancock	16.0	...	...	...	0.3	1.6	...	14.1	...
Harrison	15.5	...	0.3	...	...	4.0	0.7	10.6	...
Hinds	122.8	...	...	0.6	4.5	9.1	68.1	40.6	...
Holmes	110.8	...	...	0.3	2.6	6.9	50.3	50.8	...
Humphreys ¹	62.6	...	...	...	...	...	...	62.6	...
Issaquena	98.9	...	...	...	...	...	0.3	98.6	...
Itawamba	76.8	...	...	1.9	2.4	7.1	19.5	45.9	...
Jackson	81.2	...	1.6	...	...	4.4	10.7	64.5	...
Jasper	53.0	...	...	0.9	3.1	8.8	20.4	19.8	...
Jefferson	102.7	...	...	0.8	2.5	6.6	62.6	19.5	10.7
Jefferson Davis	19.5	...	...	...	0.2	0.2	3.0	16.1	...
Jones	61.4	...	...	...	8.8	17.8	12.4	22.4	...
Kemper	64.2	...	...	0.5	8.1	18.8	9.6	27.2	...
Lafayette	94.3	...	...	1.8	4.7	24.5	59.0	4.4	...
Lamar	33.0	...	0.8	0.7	1.5	3.0	9.3	17.6	...
Lauderdale	135.0	...	...	1.2	17.3	19.7	43.5	53.2	...
Lawrence	56.8	...	...	...	3.7	16.6	...	36.6	...
Leake	77.0	...	...	...	2.8	10.9	25.9	37.5	...
Lee	25.7	...	...	...	...	5.4	10.5	9.8	...
Lincoln	68.0	...	...	...	3.4	12.6	32.2	19.8	...
Lowndes	63.5	...	...	...	...	3.4	2.2	58.0	...
Madison	67.1	...	...	...	1.2	5.4	16.0	44.4	...
Marion	53.3	...	...	...	2.1	14.4	11.9	24.9	...
Marshall	77.3	...	...	1.2	1.8	10.4	12.1	49.0	2.7

Table 30—Volume of hardwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, Mississippi, 1987 — Continued

County	Total	Forest type group							
		Longleaf-slash pine		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum cypress	Elm-ash- cottonwood
		Planted	Natural	Planted	Natural				
----- Million cubic feet -----									
Monroe	95.1	...	...	0.8	4.2	6.1	54.5	29.5	...
Montgomery	24.6	...	...	...	0.6	4.3	19.8	...	...
Neshoba	73.8	...	...	...	2.6	12.7	26.8	31.7	...
Newton	71.0	...	...	0.2	3.6	9.7	9.2	48.3	...
Noxubee	58.4	...	...	2.1	1.7	10.3	6.4	37.9	...
Oktibbeha	58.6	...	...	...	5.2	7.3	26.5	19.7	...
Panola	60.5	...	...	6.0	...	0.7	27.9	25.9	...
Pearl River	49.8	2.0	0.9	...	2.8	3.6	8.8	31.6	...
Perry	54.4	...	1.7	0.4	1.7	15.0	9.9	25.8	...
Pike	50.1	...	...	...	0.4	28.2	17.7	3.7	...
Pontotoc	24.1	...	...	0.3	1.0	1.5	20.4	0.8	...
Prentiss	45.7	...	...	...	2.3	1.9	30.8	10.6	...
Quitman ²	64.1	...	...	...	...	...	...	56.7	7.4
Rankin	131.5	...	...	...	10.7	32.8	41.7	46.4	...
Scott	71.7	...	...	...	5.6	6.3	31.2	28.7	...
Sharkey	71.5	...	...	...	...	...	...	71.5	...
Simpson	45.5	...	...	...	7.7	12.6	6.1	19.1	...
Smith	65.5	...	1.4	...	6.7	21.3	27.2	8.8	...
Stone	17.8	...	1.0	0.6	0.4	6.1	5.5	4.1	...
Sunflower ³	70.8	...	...	...	...	...	...	50.3	20.5
Tallahatchie	69.9	...	...	...	...	1.3	30.7	37.9	...
Tate	29.5	...	...	0.7	...	...	28.7	...	...
Tippah	51.5	...	...	1.8	3.2	5.7	32.3	8.4	...
Tishomingo	48.7	...	...	...	2.2	9.9	22.6	14.1	...
Union	36.7	...	...	...	0.7	3.1	30.9	2.0	...
Walthall	36.1	...	...	...	...	0.4	6.2	29.4	...
Warren	267.9	...	...	...	...	...	143.1	94.0	30.8
Wayne	69.4	...	0.4	0.4	3.9	14.5	19.4	30.7	...
Webster	24.2	...	...	...	1.8	7.2	15.2	...	...
Wilkinson	122.0	...	...	1.9	1.9	18.0	63.3	25.1	11.8
Winston	74.8	...	...	...	4.3	21.5	22.9	26.2	...
Yalobusha	54.8	...	...	1.4	4.3	7.9	38.0	3.2	...
Yazoo	204.2	...	...	...	...	3.0	117.1	75.5	8.6
All counties	5564.1	2.9	9.0	32.5	229.0	674.5	2168.7	2307.0	140.5

¹ Leflore included in Humphreys.

² Tunica included in Quitman.

³ Washington included in Sunflower.

Table 31—*Volume of timber on timberland by county, class of timber and species group, Mississippi, 1987*

County	All classes	Growing stock		Rough		Rotten	
		Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
-----Million cubic feet-----							
Adams	305.3	45.2	214.7	0.5	37.4	0.7	6.7
Alcorn	149.7	41.7	85.8	0.7	17.7	...	3.8
Amite	581.9	343.6	180.1	9.9	40.8	...	7.4
Attala	422.0	172.1	201.5	2.6	38.5	...	7.3
Benton	269.0	78.6	157.9	3.0	20.9	...	8.5
Bolivar	111.3	2.4	83.2	...	24.0	...	1.7
Calhoun	200.1	105.3	70.1	1.0	18.6	...	5.1
Carroll	296.1	90.4	144.5	6.1	40.6	0.3	14.2
Chickasaw	181.3	79.4	82.4	2.0	15.5	...	1.8
Choctaw	279.2	158.7	92.5	4.4	21.9	...	1.7
Claiborne	393.6	36.9	287.3	3.8	60.0	...	5.6
Clarke	373.6	169.5	158.2	10.3	33.3	...	2.3
Clay	154.4	38.2	86.5	4.0	22.0	...	3.6
Coahoma	121.3	5.6	89.4	1.6	23.5	...	1.2
Copiah	492.8	215.0	222.6	9.0	38.2	...	8.0
Covington	176.6	43.1	106.8	0.5	22.3	...	4.0
De Soto	148.4	6.9	116.7	0.4	23.2	...	1.1
Forrest	250.2	163.7	69.1	4.3	9.3	0.5	3.3
Franklin	701.5	466.0	182.9	8.6	34.3	1.2	8.5
George	221.3	101.6	89.6	1.2	26.2	...	2.7
Greene	428.9	236.2	148.8	7.0	32.0	...	5.0
Grenada	187.5	77.2	92.6	0.5	12.4	...	4.8
Hancock	157.4	99.2	35.7	3.8	12.9	0.9	5.0
Harrison	240.0	161.0	42.3	7.8	24.9	0.2	3.7
Hinds	328.7	81.5	205.7	4.6	34.8	...	2.1
Holmes	348.4	63.8	217.5	1.4	59.2	...	6.5
Humphreys ¹	141.5	...	113.5	...	19.7	...	8.2
Issaquena	197.6	3.3	143.5	2.0	35.5	1.3	12.0
Itawamba	329.9	115.2	166.6	5.5	29.7	0.4	12.4
Jackson	355.1	143.7	167.9	1.4	37.4	0.3	4.4
Jasper	359.1	176.5	131.8	8.5	28.9	0.9	12.5
Jefferson	324.7	88.6	186.4	3.4	41.0	0.2	5.2
Jefferson Davis	106.1	47.9	40.3	1.1	15.4	...	1.5
Jones	410.5	231.4	124.9	9.3	41.0	...	3.9
Kemper	427.6	253.8	136.3	8.4	24.1	...	5.0
Lafayette	419.4	205.7	177.7	5.9	21.9	0.4	7.7
Lamar	220.0	107.8	72.0	8.5	30.2	...	1.5
Lauderdale	647.2	323.2	266.6	9.6	33.1	0.5	14.3
Lawrence	270.3	132.6	97.7	6.2	28.0	...	5.8
Leake	320.3	144.5	143.6	5.8	21.5	...	5.0
Lee	94.4	26.5	53.9	2.0	10.7	...	1.2
Lincoln	305.6	145.7	131.9	3.0	21.4	...	3.7
Lowndes	209.8	48.1	120.7	4.4	31.8	...	4.8
Madison	236.9	72.8	127.2	5.3	28.9	...	2.7
Marion	270.0	135.0	109.4	2.0	20.8	...	2.8
Marshall	283.8	95.2	142.6	4.7	38.0	...	3.3

**Table 31—Volume of timber on timberland by county, class of timber and species group,
Mississippi, 1987 — Continued**

County	All classes	Growing stock		Rough		Rotten	
		Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
-----Million cubic feet-----							
Monroe	318.9	76.6	200.3	1.9	34.1	...	6.1
Montgomery	136.6	58.5	55.1	2.3	17.4	...	3.3
Neshoba	336.8	124.4	150.6	13.2	40.6	...	8.0
Newton	318.7	145.3	138.0	6.8	22.2	1.4	5.2
Noxubee	332.5	184.7	123.0	4.3	16.0	...	4.6
Oktibbeha	233.0	108.8	103.4	3.4	13.7	0.8	2.9
Panola	207.2	61.8	116.3	0.6	27.4	...	1.3
Pearl River	275.0	135.0	101.6	4.7	29.9	...	3.8
Perry	424.7	263.1	125.5	7.1	25.6	...	3.4
Pike	217.2	105.0	83.5	4.2	23.6	...	0.9
Pontotoc	122.2	40.4	67.1	1.1	11.4	...	2.2
Prentiss	160.3	49.4	91.2	1.1	14.7	...	3.8
Quitman ²	131.5	4.4	96.4	0.7	25.2	...	4.8
Rankin	499.9	230.2	233.8	6.0	26.4	...	3.4
Scott	410.0	220.6	148.9	9.5	25.4	...	5.6
Sharkey	117.4	...	96.0	...	15.9	0.3	5.1
Simpson	243.3	133.5	88.1	0.7	19.1	...	1.9
Smith	444.7	279.2	125.7	7.8	28.5	...	3.5
Stone	228.0	152.0	53.8	3.8	17.5	...	0.9
Sunflower ³	148.4	7.8	116.6	0.5	18.4	1.9	3.3
Tallahatchie	181.3	31.6	118.7	1.2	22.5	0.2	6.9
Tate	84.8	13.6	53.6	2.4	15.0	...	0.1
Tippah	210.7	78.2	106.7	5.1	17.1	...	3.5
Tishomingo	243.7	106.7	107.6	2.3	23.0	...	4.1
Union	114.7	32.6	71.2	...	10.6	...	0.3
Walthall	129.8	32.1	65.3	3.3	25.3	0.4	3.4
Warren	443.8	7.5	360.4	1.4	61.6	...	12.9
Wayne	444.4	257.0	149.8	4.1	28.6	...	4.8
Webster	132.1	49.6	55.8	1.3	22.3	...	3.1
Wilkinson	442.7	172.6	212.0	4.2	49.1	...	4.7
Winston	425.4	225.2	155.8	6.4	29.0	0.3	8.7
Yalobusha	239.6	112.2	100.0	2.3	19.3	...	5.7
Yazoo	447.8	6.4	348.4	0.2	69.6	0.9	22.3
All counties	22297.2	9086.8	10338.7	310.0	2149.5	14.1	398.1

¹ Leflore included in Humphreys.

² Tunica included in Quitman.

³ Washington included in Sunflower.

Table 32—Number of live trees on timberland by detailed species and diameter class, Mississippi, 1987

Species	Diameter class (inches at breast height)												
	All classes	1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----													
Longleaf pine	105687	38346	24989	13459	8364	6700	6386	4072	2068	986	223	93	...
Slash pine	236748	87231	64700	41321	21906	10881	5590	2704	1542	559	246	68	...
Shortleaf pine	398715	133748	82312	60448	49542	32337	21745	10643	5135	1968	557	281	...
Loblolly pine	1336288	551074	341326	166418	109299	61014	41709	29332	16975	9434	5102	4452	152
Spruce pine	14789	4266	1647	2148	1911	1146	1129	873	543	406	391	320	9
Redcedar	123247	84720	21168	10183	3813	1812	747	490	174	110	21	9	...
Hemlock-spruce	84	...	...	...	65	...	...	19	...	...	...	...	...
Cypress	40418	18888	13083	3140	1979	1015	927	297	283	271	112	321	103
Total softwoods	2255977	918274	549225	297116	196879	114906	78232	48430	26720	13733	6652	5545	264
Select white oaks	305917	157632	65029	30247	17176	11175	8146	6176	4276	2488	1491	1906	175
Select red oaks	107055	47197	20468	11034	8297	4940	4209	3155	2873	1654	1049	1794	384
Other white oaks	255189	129265	46774	27253	19634	12317	7891	5385	3034	1385	964	1039	250
Other red oaks	1031352	635107	151950	82084	50548	38759	25201	17827	11392	7103	4339	5910	1132
Sweet pecan	10052	5676	751	1073	581	727	396	237	162	102	111	183	54
Water hickory	48687	32727	9440	2058	1509	848	449	555	347	315	212	215	12
Other hickories	407586	292538	52298	24085	11862	9285	7283	4669	2494	1437	887	724	26
Persimmon	169880	140417	21037	5203	1851	1022	242	45	14	39	10	...	...
Hard maple	15211	10944	2297	1060	356	262	135	68	45	13	24	5	...
Soft maple	633936	477911	102004	33022	12049	4274	2475	1149	489	294	146	115	10
Boxelder	45048	27534	6258	3914	2287	2508	1301	602	410	117	48	68	...
Beech	38900	22550	6581	2720	1447	1066	674	871	845	710	411	890	134
Sweetgum	1470047	920377	289021	128148	61477	34248	16049	10035	5243	2634	1273	1434	108
Blackgum	560869	413946	73949	32081	17824	9319	5875	4214	2018	890	377	337	41
Other gums/tupelos	56907	19503	11476	7705	6578	4479	3046	1830	1207	593	232	238	21
White ash	49388	34102	7471	3502	1321	1203	594	516	207	254	171	47	...
Other ashes	135549	87923	20044	11485	6369	3473	2591	1486	1023	477	260	356	62
Sycamore	17525	4386	3230	2466	2674	1326	725	1041	648	339	264	378	49
Cottonwood	4523	...	993	387	1127	390	246	214	210	226	190	343	198
Basswood	6422	5066	...	77	470	189	189	248	76	24	31	53	...
Yellow-poplar	165129	110486	18523	11936	7350	4551	3992	3103	2207	1203	678	979	120
Magnolia	25919	17501	4907	1103	811	506	461	173	176	132	95	43	12
Sweetbay	203693	133745	34476	15121	8704	4704	3138	1725	1199	439	305	127	9
Willow	58745	40687	10373	3345	1403	937	472	495	284	254	240	186	69
Black walnut	3080	612	1062	623	284	283	83	40	35	27	30	...	...
Black cherry	159629	119312	24169	8754	3800	2163	526	383	239	171	72	39	...
American elm	78352	46576	14532	5816	4512	2832	1296	1470	604	342	152	182	37
Other elms	349256	268568	54167	13793	5969	3333	1285	1101	471	185	166	209	8
River birch	17670	12620	1618	797	717	609	445	394	222	112	71	60	5
Hackberry	98907	47584	20020	9953	7474	5437	3325	2064	1390	819	455	365	21
Black locust	21526	15594	3496	1183	548	579	58	55	15	...	...	...	...
Other locusts	5140	2925	646	269	434	485	130	92	46	49	47	16	...
Sassafras	64456	45603	12921	2858	1550	707	185	331	141	54	65	35	5
Dogwood	642394	470436	141137	26723	3714	302	66	...	15	...	...	...	...
Holly	60808	47781	8456	2139	1616	386	256	64	95	...	...	16	...
Other commercial	71320	53334	10124	4588	1841	724	372	220	49	32	11	21	3
Total hardwoods	7396067	4898166	1251698	518603	276163	170347	103806	72033	44202	24916	14877	18314	2944
Noncommercial	925435	720273	120448	55524	18446	7503	1641	787	529	183	73	26	3
All species	10577497	6536712	1921372	871242	491488	292755	183679	121250	71450	38832	21602	23884	3211

Table 33—Number of growing-stock trees on timberland by detailed species and diameter class, Mississippi, 1987

Species	Diameter class (inches at breast height)										
	All classes	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----											
Longleaf pine	41420	12947	8323	6548	6303	3985	2068	976	184	87	...
Slash pine	80533	38755	21137	10193	5474	2591	1531	546	237	68	...
Shortleaf pine	171244	51705	47841	31886	21496	10532	5072	1926	528	258	...
Loblolly pine	412775	149887	102417	57599	39866	28410	16362	9052	4861	4206	114
Spruce pine	8173	1836	1726	1055	1129	810	505	406	382	314	9
Redcedar	13775	8344	3147	1266	520	285	140	59	12	...	...
Hemlock-spruce	84	...	65	...	...	19	...	...	...	...	...
Cypress	7582	2862	1924	749	851	278	252	217	94	295	60
Total softwoods	735587	266336	186581	109296	75639	46911	25931	13183	6299	5228	183
Select white oaks	71967	25672	15356	10276	7039	5360	3568	2147	1104	1398	46
Select red oaks	33571	8654	7504	4361	3667	2912	2539	1443	916	1398	176
Other white oaks	61156	20163	16077	10110	5917	4245	2286	888	754	630	87
Other red oaks	201420	65345	44544	34427	20080	14645	9414	5440	3339	3749	435
Sweet pecan	2879	967	353	662	302	124	147	82	55	146	39
Water hickory	5107	1478	1376	689	339	393	286	202	153	188	4
Other hickories	50820	18117	10253	8123	6201	3875	2095	1110	588	445	12
Persimmon	5716	3368	1289	845	149	21	14	20	10	...	...
Hard maple	1571	858	311	183	101	68	26	13	11	...	...
Soft maple	29498	18136	6460	2503	1451	515	175	161	66	30	...
Boxelder	5857	1984	1124	1439	658	394	156	71	15	16	...
Beech	6989	2144	1261	886	434	611	596	427	201	402	27
Sweetgum	211316	98479	53085	30324	12778	8394	4212	2052	970	974	49
Blackgum	50994	19988	13306	7654	4353	3158	1539	649	181	164	3
Other gums/tupelos	19828	4935	5627	3936	2064	1535	1019	456	180	72	4
White ash	5356	1727	1247	973	455	400	167	222	148	18	...
Other ashes	20416	8147	5050	2666	1810	1135	706	382	219	258	42
Sycamore	8122	2213	2214	930	583	841	544	284	202	277	34
Cottonwood	3054	263	915	390	213	214	181	208	190	296	184
Basswood	1046	77	391	189	61	201	36	24	21	47	...
Yellow-poplar	30359	9498	6625	3924	3299	2678	1814	1130	504	805	82
Magnolia	2814	1103	661	415	252	107	106	76	62	28	4
Sweetbay	22569	10416	6215	2879	1704	614	472	150	94	26	...
Willow	4568	1745	858	593	347	262	163	230	177	159	35
Black walnut	927	492	144	134	33	40	35	27	21	...	...
Black cherry	9380	5256	1861	1406	298	260	165	91	42	...	...
American elm	11957	3593	3415	2048	787	1266	411	244	86	91	17
Other elms	19419	9655	4555	2820	983	782	306	106	104	107	...
River birch	2571	512	583	464	322	334	185	89	47	34	...
Hackberry	20520	5570	5566	3789	2025	1526	860	661	323	192	8
Black locust	1181	492	167	409	58	55	...	...	...	...	...
Other locusts	717	90	149	264	60	31	46	49	28	...	...
Sassafras	3289	1498	865	432	106	249	47	39	30	21	...
Dogwood	8248	7493	740	...	...	...	15	...	...	...	...
Holly	2931	1602	873	217	177	47	15	...	...	...	...
Other commercial	1555	904	489	162	...	...	...	...	...	...	...
Total hardwoods	939687	362635	221512	141523	79108	57291	34346	19173	10840	11970	1287
All species	1675273	628971	408093	250819	154746	104202	60277	32356	17139	17199	1471

Table 34—Volume of growing-stock trees on timberland by species and diameter class, Mississippi, 1987

Species	All classes	Diameter class (inches at breast height)									
		5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Million cubic feet-----											
Longleaf pine	604.5	37.2	57.9	90.9	141.2	123.4	85.4	49.9	11.5	6.9	...
Slash pine	671.0	93.0	134.0	127.5	112.2	83.2	65.9	32.0	16.3	6.9	...
Shortleaf pine	2100.9	153.8	345.8	439.4	449.6	327.7	215.1	105.7	38.6	25.2	...
Loblolly pine	5347.0	365.9	622.6	723.6	802.7	854.8	678.1	501.3	343.9	432.1	21.9
Spruce pine	189.5	5.8	11.0	12.3	22.5	26.8	22.0	25.2	28.0	34.2	1.6
Redcedar	64.6	17.1	16.7	11.3	7.2	5.5	4.1	2.2	0.5	...	...
Hemlock-spruce	0.8	...	0.3	...	...	0.5	...	...	...	...	...
Cypress	108.5	5.5	11.3	10.0	16.7	8.1	8.9	10.5	4.8	24.3	8.3
Total softwoods	9086.8	678.4	1199.5	1415.1	1552.2	1430.0	1079.5	726.7	443.7	529.8	31.8
Select white oaks	939.8	67.1	95.9	116.1	126.6	139.3	126.5	94.0	61.8	104.6	7.9
Select red oaks	616.6	23.4	45.3	47.4	67.4	76.6	88.4	68.9	52.9	117.7	28.7
Other white oaks	593.8	45.9	82.5	96.3	88.6	90.3	63.6	34.2	34.4	45.6	12.3
Other red oaks	2577.1	173.5	265.5	367.5	341.0	352.8	307.4	232.6	182.8	289.3	64.7
Sweet pecan	51.9	2.0	2.1	6.7	5.7	3.1	5.3	3.6	4.0	13.1	6.4
Water hickory	74.8	4.6	7.5	6.7	4.8	9.4	9.6	8.7	8.2	14.6	0.7
Other hickories	588.8	41.6	57.8	85.8	107.0	99.7	74.5	51.0	34.2	36.4	0.9
Persimmon	32.9	9.1	7.8	10.9	2.6	0.5	0.5	1.0	0.6	...	...
Hard maple	11.8	2.5	1.8	2.2	2.1	1.5	0.8	0.4	0.6	...	...
Soft maple	158.2	45.1	36.9	24.6	22.8	12.0	4.9	6.4	3.2	2.4	...
Boxelder	55.5	5.1	6.9	14.6	10.9	8.8	5.3	2.5	0.6	0.8	...
Beech	129.9	5.2	6.6	9.7	6.8	15.3	20.1	19.4	11.4	31.1	4.3
Sweetgum	1771.0	220.7	310.4	336.7	240.2	230.8	163.3	106.1	64.5	90.7	7.6
Blackgum	448.1	44.7	72.2	81.4	73.1	76.4	52.0	26.2	10.1	11.7	0.3
Other gums/tupelos	226.6	13.0	32.5	43.4	36.1	37.2	31.0	19.2	9.3	4.5	0.4
White ash	68.8	4.9	8.4	9.8	8.0	10.5	6.3	10.7	8.5	1.7	...
Other ashes	210.2	21.1	30.3	29.5	30.6	26.9	23.1	15.3	11.2	17.2	5.2
Sycamore	153.2	7.8	16.3	14.0	11.7	24.5	21.0	14.7	13.0	25.5	4.7
Cottonwood	126.6	0.7	6.2	4.3	4.0	5.0	7.3	11.4	12.7	34.1	40.8
Basswood	19.9	0.3	2.5	2.0	1.5	5.5	1.3	1.2	1.1	4.5	...
Yellow-poplar	502.0	25.9	43.1	47.0	61.9	74.5	72.6	56.9	32.9	72.5	14.7
Magnolia	29.8	2.7	3.9	4.1	4.2	2.3	3.9	3.2	3.0	1.9	0.5
Sweetbay	171.1	29.6	39.9	31.7	28.4	14.5	15.2	5.8	4.5	1.6	...
Willow	76.6	3.8	4.6	5.5	5.6	7.0	6.6	12.8	11.4	14.7	4.5
Black walnut	7.2	0.7	0.5	1.4	0.5	1.1	1.1	1.1	0.8	...	...
Black cherry	63.4	13.2	10.5	15.3	5.4	7.0	6.0	4.0	2.0	...	...
American elm	130.1	9.3	19.6	22.3	14.2	29.9	13.3	9.9	4.0	5.6	2.0
Other elms	146.4	21.8	26.2	31.1	17.0	19.6	10.2	4.9	5.9	9.8	...
River birch	39.3	1.9	3.4	5.2	5.7	8.3	6.3	3.8	2.5	2.2	...
Hackberry	233.3	14.1	31.6	39.7	32.6	33.7	24.6	27.5	16.1	12.4	0.9
Black locust	9.2	1.9	1.3	3.9	1.0	1.2	...	...	...	...	...
Other locusts	11.2	0.5	0.9	2.9	1.3	0.6	1.3	2.2	1.5	...	...
Sassafras	27.7	3.0	5.5	4.4	1.8	6.0	1.5	1.9	1.8	1.7	...
Dogwood	16.6	13.7	2.7	...	...	...	0.3	...	...	...	...
Holly	13.2	3.5	4.1	1.8	2.4	0.8	0.6	...	...	...	...
Other commercial	6.0	2.5	2.0	1.5	...	...	...	...	...	...	...
Total hardwoods	10338.7	886.1	1295.6	1527.2	1373.8	1432.7	1175.4	861.5	611.4	967.9	207.1
All species	19425.5	1564.4	2495.2	2942.3	2926.0	2862.8	2254.9	1588.3	1055.1	1497.7	238.9

Table 35—*Volume of growing stock in the saw-log portion of sawtimber trees on timberland by detailed species and diameter class, Mississippi, 1987*

Species	All classes	Diameter class (inches at breast height)							
		9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million cubic feet -----									
Longleaf pine	444.6	73.6	125.5	110.3	75.2	43.6	10.3	6.1	...
Slash pine	386.5	97.1	98.9	77.7	61.3	29.6	15.2	6.6	...
Shortleaf pine	1425.0	359.0	405.8	303.6	199.1	97.9	36.2	23.4	...
Loblolly pine	3901.7	575.0	715.3	784.9	626.4	463.7	319.3	397.3	19.7
Spruce pine	157.6	9.8	19.8	24.5	20.4	23.4	26.0	32.3	1.4
Redcedar	25.5	9.0	5.6	4.8	3.8	1.8	0.5	...	...
Hemlock-spruce	0.4	...	...	0.4	...	...	...	...	...
Cypress	82.2	7.3	13.9	7.3	8.2	9.9	4.4	23.0	8.2
Total softwoods	6423.6	1130.9	1384.9	1313.6	994.4	670.0	411.9	488.6	29.3
Select white oaks	558.1	...	94.7	117.1	109.4	82.9	54.1	92.8	7.1
Select red oaks	429.3	...	47.9	66.2	77.6	59.8	47.6	105.3	24.9
Other white oaks	314.2	...	68.2	77.8	56.4	29.8	30.0	40.8	11.2
Other red oaks	1490.4	...	245.8	296.4	268.4	201.8	160.3	257.9	59.7
Sweet pecan	35.1	...	4.4	2.5	4.3	3.3	3.5	11.4	5.8
Water hickory	47.5	...	3.7	7.4	8.0	7.8	7.2	12.8	0.5
Other hickories	331.0	...	79.3	82.8	62.9	44.8	29.1	31.3	0.8
Persimmon	4.1	...	1.7	0.5	0.4	0.9	0.6	...	...
Hard maple	4.6	...	1.8	1.1	0.8	0.4	0.5	...	...
Soft maple	39.5	...	16.3	9.6	3.8	5.2	2.7	2.0	...
Boxelder	21.6	...	7.9	7.0	3.7	1.9	0.6	0.5	...
Beech	91.9	...	5.1	12.5	17.1	15.8	10.0	28.0	3.4
Sweetgum	741.9	...	165.4	189.7	143.7	94.5	58.9	82.7	6.8
Blackgum	210.7	...	54.2	65.6	47.2	23.2	9.3	10.9	0.3
Other gums/tupelos	114.1	...	25.3	30.2	28.0	17.5	8.4	4.2	0.4
White ash	36.9	...	5.9	8.2	5.3	8.6	7.5	1.4	...
Other ashes	107.0	...	21.7	21.2	20.2	13.8	10.1	15.3	4.8
Sycamore	98.4	...	8.3	19.8	18.6	12.8	11.6	22.6	4.6
Cottonwood	104.3	...	2.4	4.1	6.5	10.2	11.6	31.4	38.2
Basswood	12.8	...	1.1	4.5	1.1	1.2	1.0	3.8	...
Yellow-poplar	331.9	...	44.1	62.7	64.3	51.4	30.3	65.9	13.2
Magnolia	16.6	...	3.1	2.0	3.6	2.9	2.8	1.9	0.4
Sweetbay	57.3	...	21.1	12.0	13.3	5.5	4.0	1.4	...
Willow	56.7	...	4.2	6.0	5.7	12.2	10.6	13.6	4.4
Black walnut	3.7	...	0.4	0.8	1.0	0.9	0.7	...	...
Black cherry	19.9	...	3.7	5.9	5.2	3.6	1.6	...	...
American elm	64.0	...	10.6	23.9	10.9	8.4	3.7	4.8	1.7
Other elms	53.6	...	12.1	15.8	8.6	3.8	5.0	8.1	...
River birch	23.8	...	4.4	6.9	5.2	3.3	2.2	1.9	...
Hackberry	120.1	...	22.8	26.3	20.6	24.0	14.5	11.2	0.8
Black locust	1.6	...	0.6	1.0	...	...	...	...	...
Other locusts	5.8	...	0.9	0.5	1.2	1.9	1.4	...	...
Sassafras	12.7	...	1.3	5.1	1.2	1.7	1.7	1.7	...
Dogwood	0.3	...	...	...	0.3	...	...	...	...
Holly	3.0	...	1.7	0.7	0.6	...	...	...	...
Total hardwoods	5564.1	...	992.0	1193.6	1024.9	755.8	543.2	865.6	188.9
All species	11987.7	1130.9	2376.9	2507.1	2019.3	1425.8	955.1	1354.2	218.3

Table 36—Volume of timber on timberland by species and class of timber, Mississippi, 1987

Species	All live	Growing stock	Rough	Rotten
----- Million cubic feet -----				
Longleaf pine	614.1	604.5	9.0	0.6
Slash pine	692.1	671.0	21.1	...
Shortleaf pine	2143.9	2100.9	41.9	1.1
Loblolly pine	5557.8	5347.0	205.3	5.5
Spruce pine	196.1	189.5	6.0	0.6
Redcedar	81.9	64.6	16.8	0.4
Hemlock-spruce	0.8	0.8	...	...
Cypress	124.2	108.5	9.8	5.8
Total softwoods	9410.9	9086.8	310.0	14.1
Select white oaks	1064.7	939.8	98.3	26.6
Select red oaks	706.6	616.6	75.0	15.0
Other white oaks	732.0	593.8	116.0	22.2
Other red oaks	3089.1	2577.1	411.2	100.8
Sweet pecan	63.0	51.9	11.1	...
Water hickory	93.3	74.8	15.1	3.4
Other hickories	690.2	588.8	74.5	26.9
Persimmon	42.6	32.9	8.8	0.8
Hard maple	15.0	11.8	3.1	...
Soft maple	257.1	158.2	88.0	10.8
Boxelder	96.4	55.5	38.3	2.6
Beech	196.4	129.9	40.5	26.0
Sweetgum	2062.3	1771.0	241.1	50.2
Blackgum	563.0	448.1	93.7	21.1
Other gums/tupelos	272.9	226.6	37.2	9.1
White ash	82.8	68.8	12.6	1.4
Other ashes	263.7	210.2	50.0	3.5
Sycamore	183.2	153.2	24.8	5.2
Cottonwood	133.9	126.6	3.8	3.6
Basswood	25.2	19.9	4.3	0.9
Yellow-poplar	567.1	502.0	52.8	12.3
Magnolia	40.2	29.8	10.1	0.4
Sweetbay	269.2	171.1	76.5	21.6
Willow	98.1	76.6	17.7	3.8
Black walnut	9.3	7.2	2.0	0.1
Black cherry	94.5	63.4	28.4	2.8
American elm	168.9	130.1	34.9	3.9
Other elms	186.4	146.4	35.9	4.1
River birch	49.2	39.3	8.5	1.4
Hackberry	315.0	233.3	76.6	5.1
Black locust	12.8	9.2	2.8	0.8
Other locusts	17.2	11.2	5.9	0.1
Sassafras	42.7	27.7	9.2	5.9
Dogwood	52.3	16.6	34.9	0.8
Holly	21.7	13.2	7.6	0.8
Other commercial	26.7	6.0	16.7	4.0
Total hardwoods	12604.8	10338.7	1868.0	398.1
Noncommercial	281.5	...	281.5	...
All species	22297.2	19425.5	2459.6	412.2

FIGURES



Figure 1.—*Location of Forest Inventory and Analysis plots on timberland, Mississippi, 1987.*

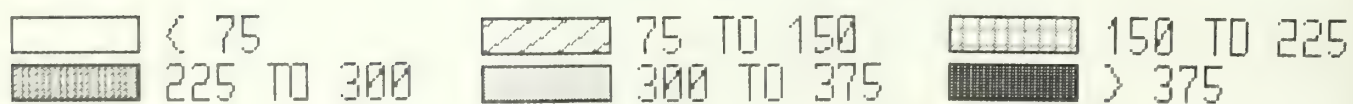
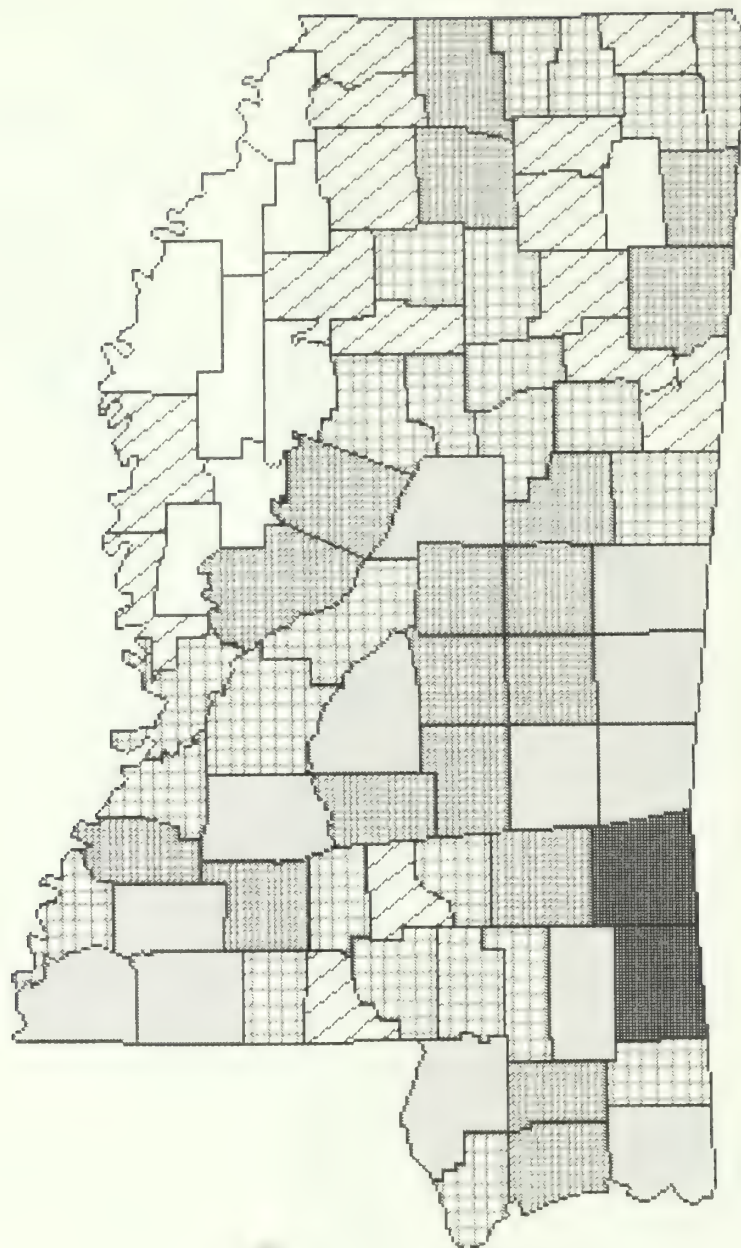


Figure 2.—*Total timberland by county in thousand acres, Mississippi, 1987.*

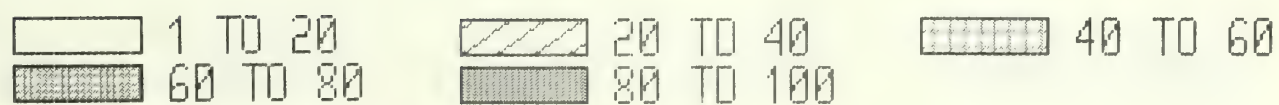
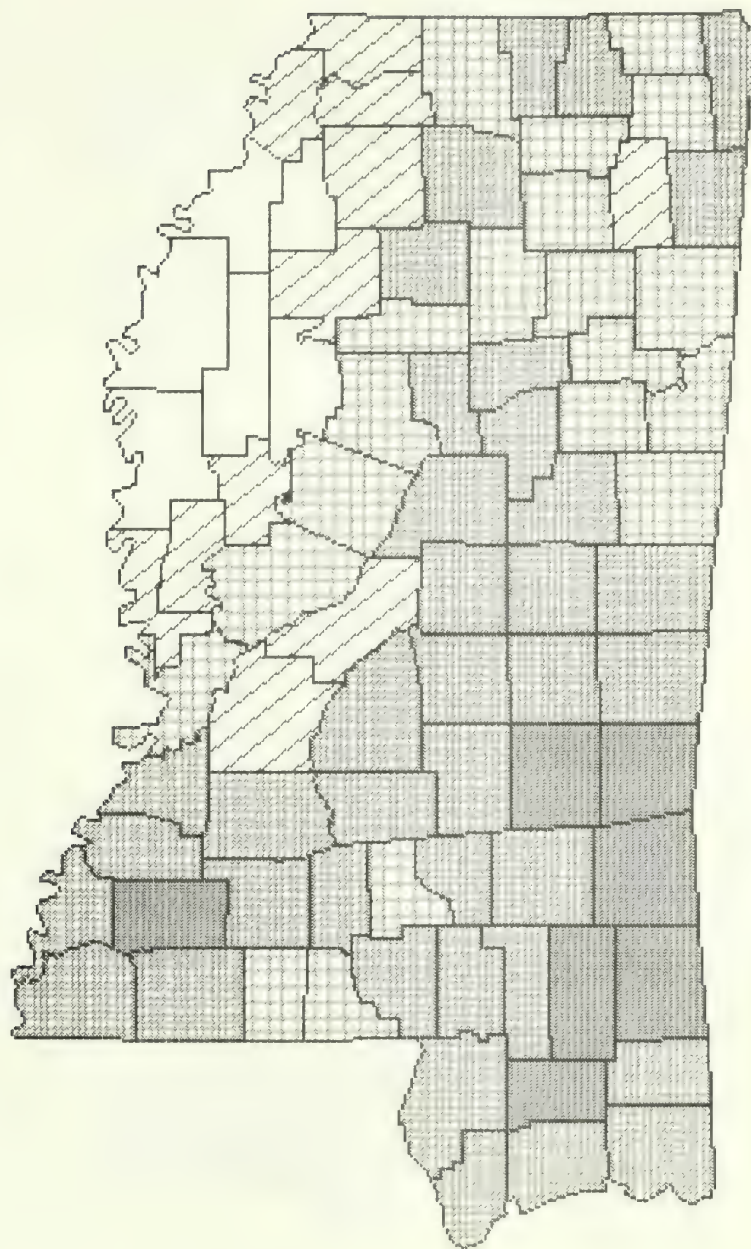


Figure 3.—*Percent timberland of total land area by county, Mississippi, 1987.*



Figure 4.—*Percent timberland by county, Longleaf/Slash pine forest type, Mississippi, 1987.*

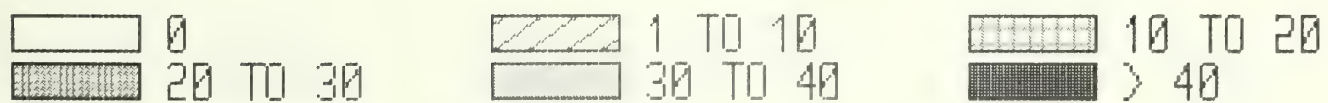
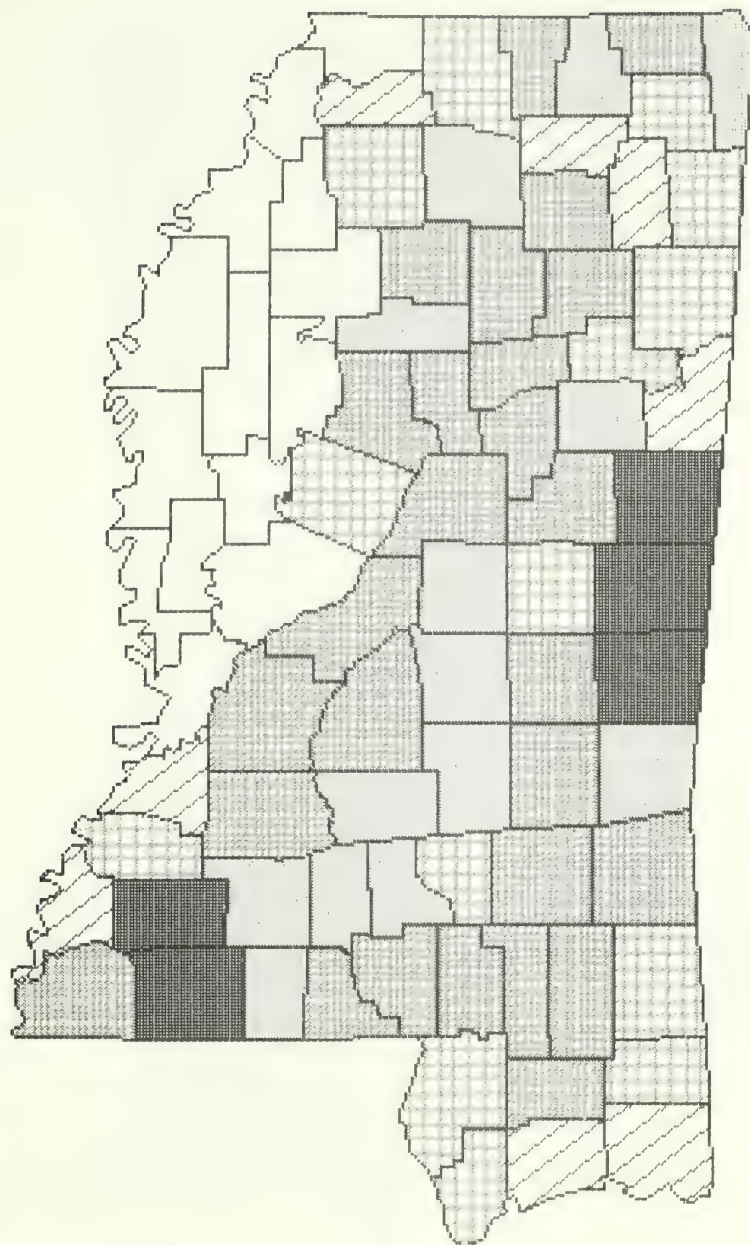


Figure 5.—Percent timberland by county, Loblolly/Shortleaf pine forest type, Mississippi, 1987.

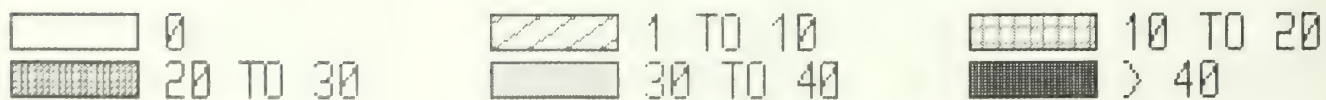
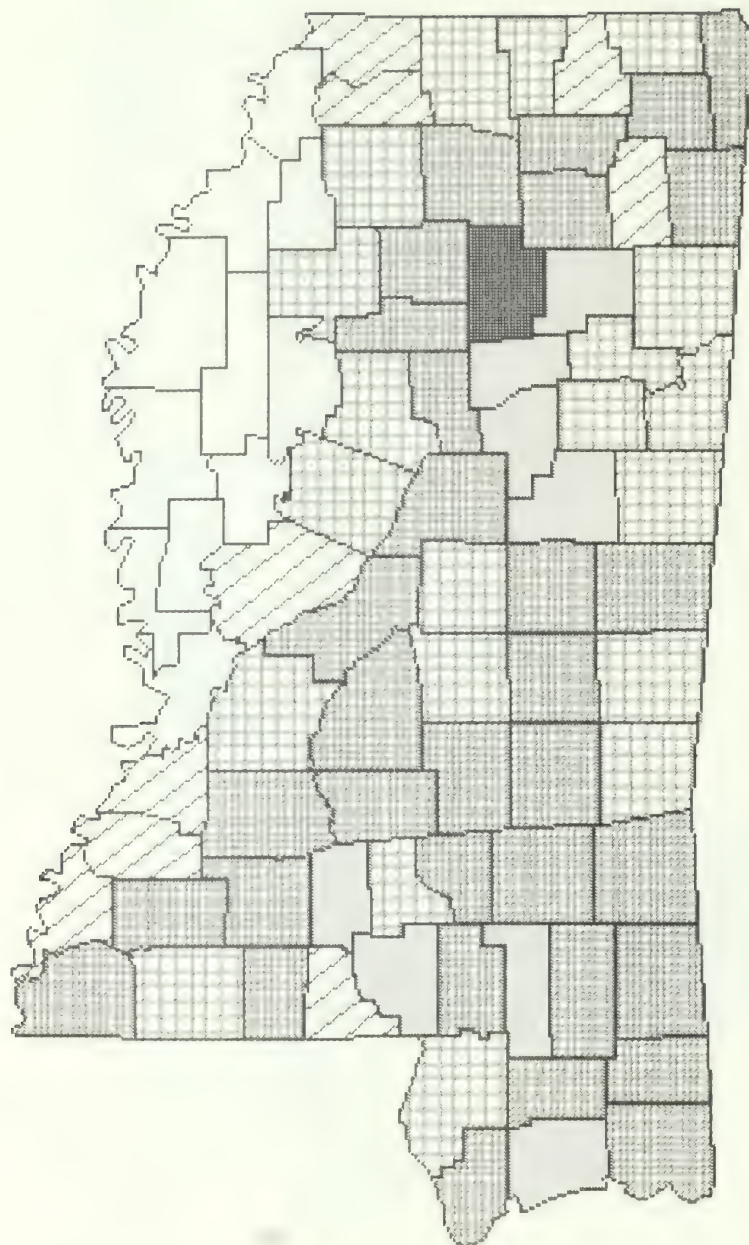


Figure 6.—*Percent timberland by county, Oak/Pine forest type, Mississippi, 1987.*

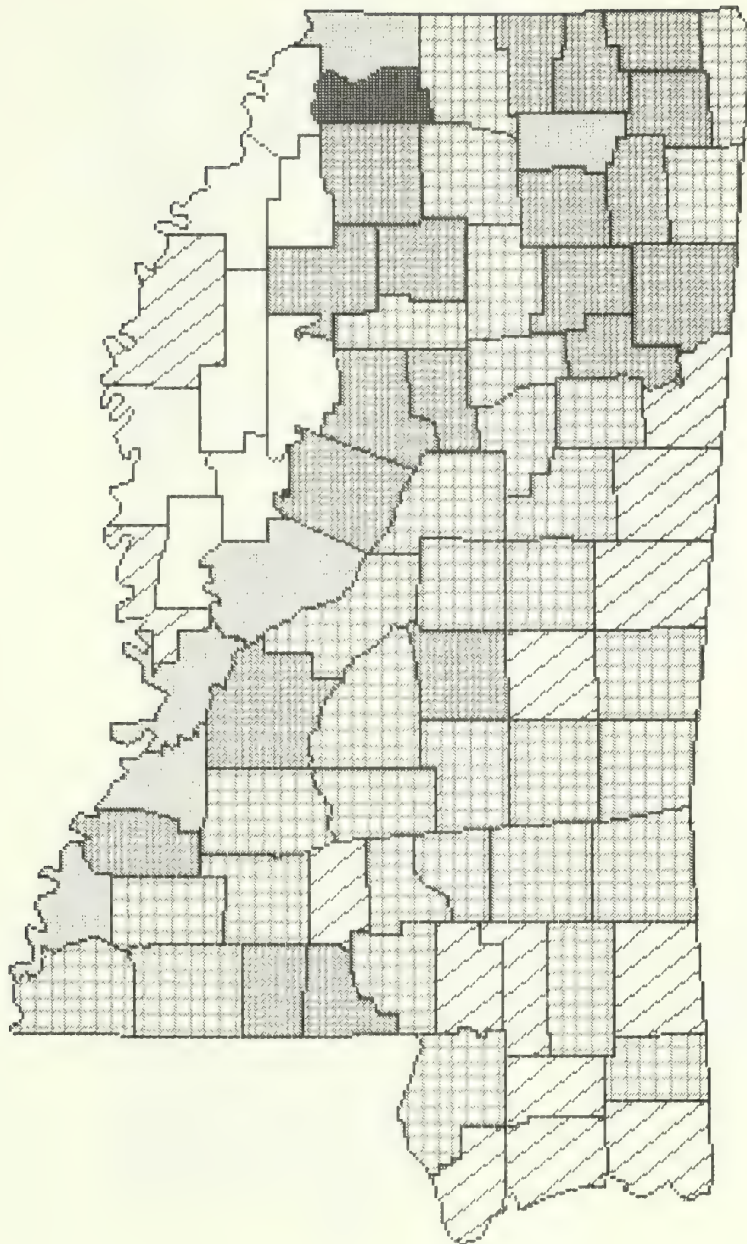


Figure 7.—Percent timberland by county, Oak/Hickory forest type, Mississippi, 1987.

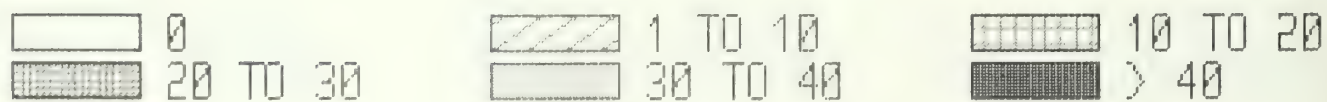
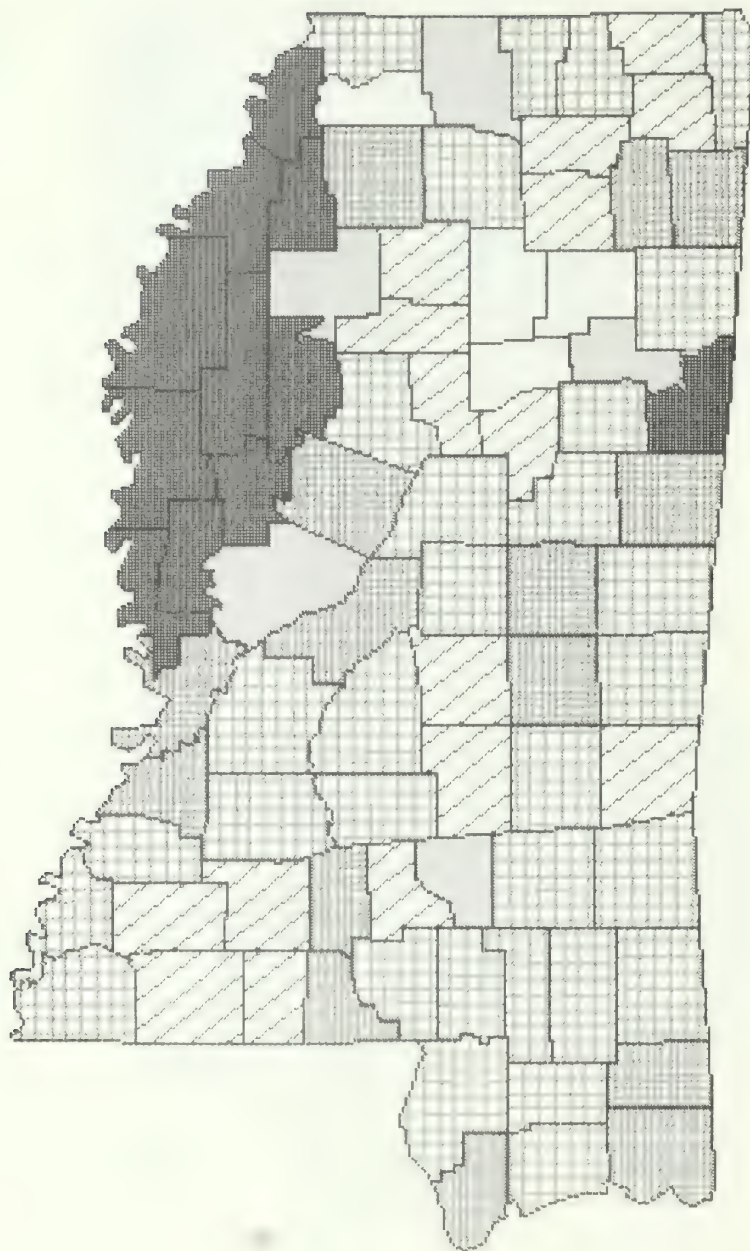


Figure 8.—*Percent timberland by county, Oak/Gum/Cypress forest type, Mississippi, 1987.*

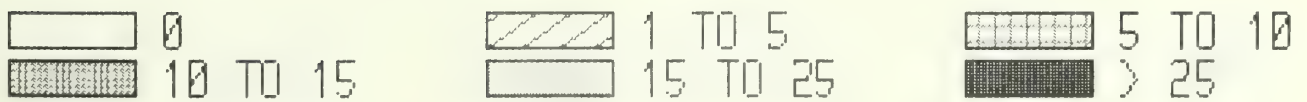
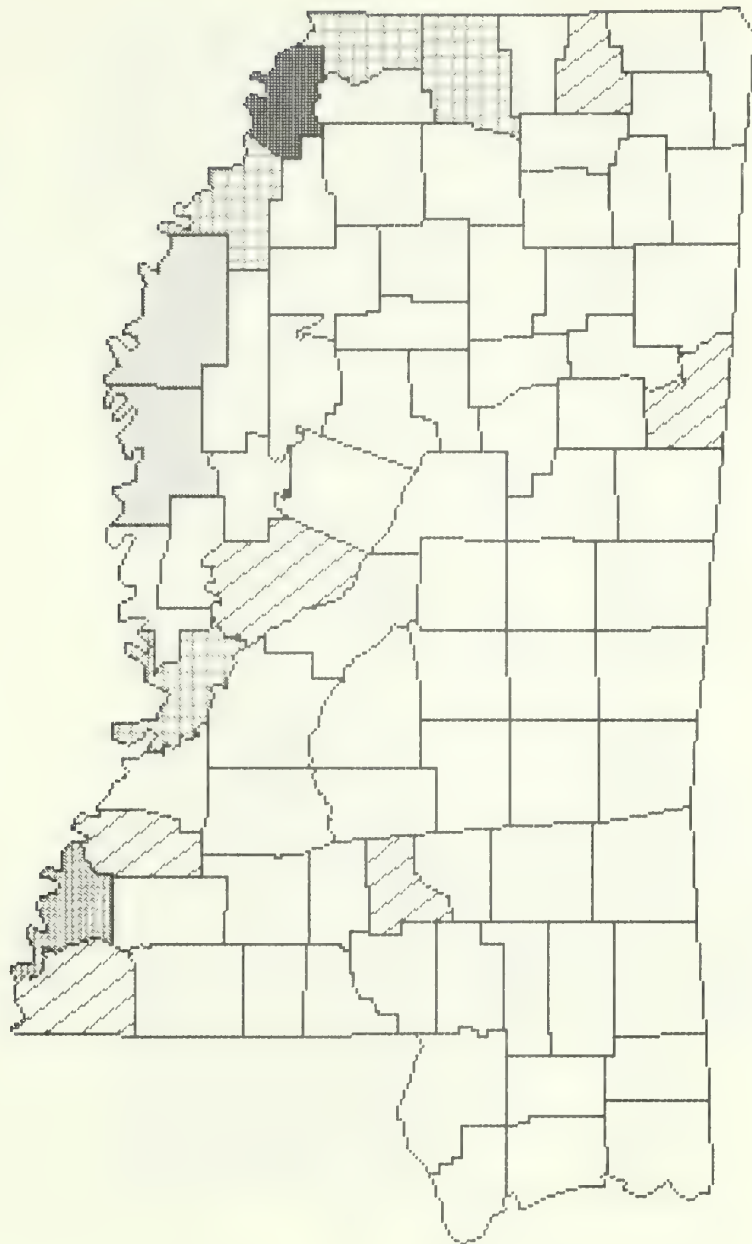


Figure 9.—Percent timberland by county, Elm/Ash/Cottonwood forest type, Mississippi, 1987.

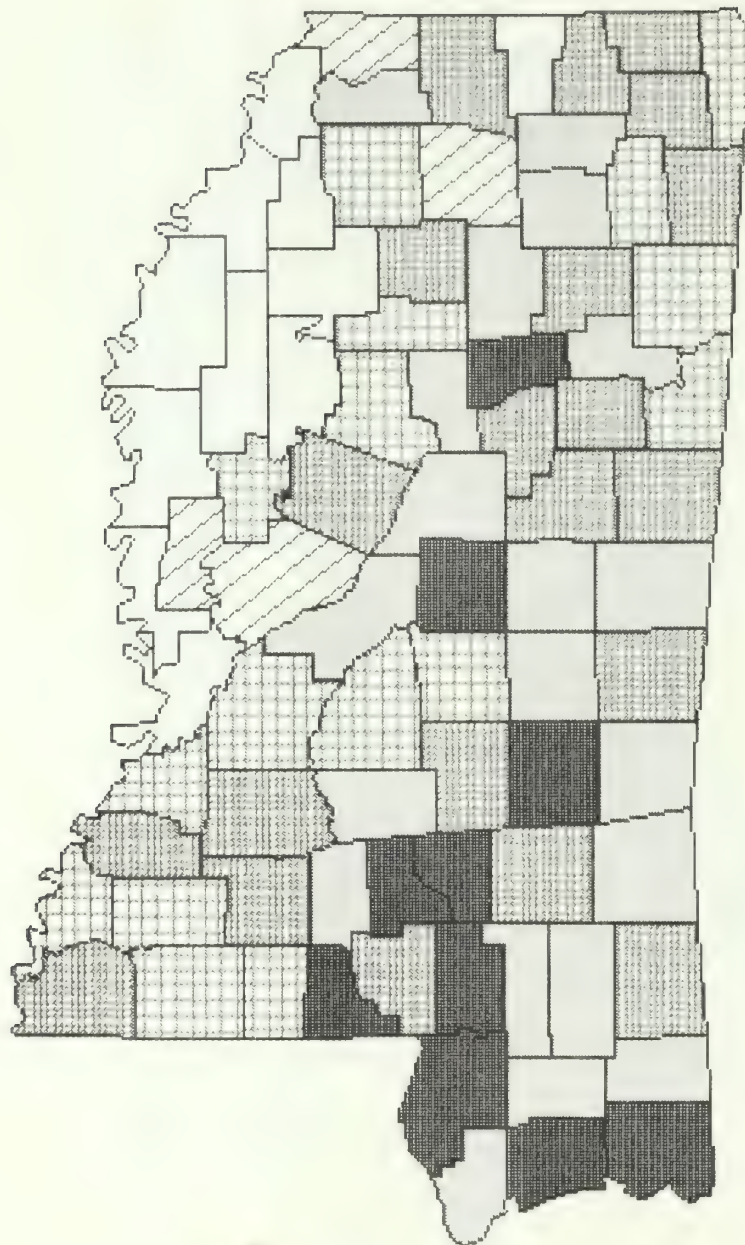


Figure 10.—Percent timberland by county, sapling and seedling stand-size class, Mississippi, 1987.

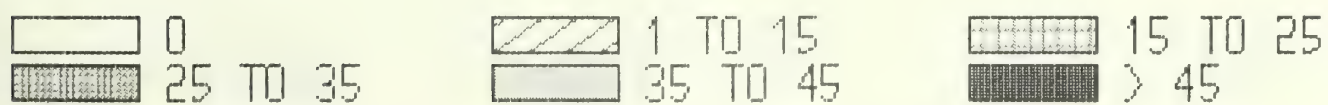
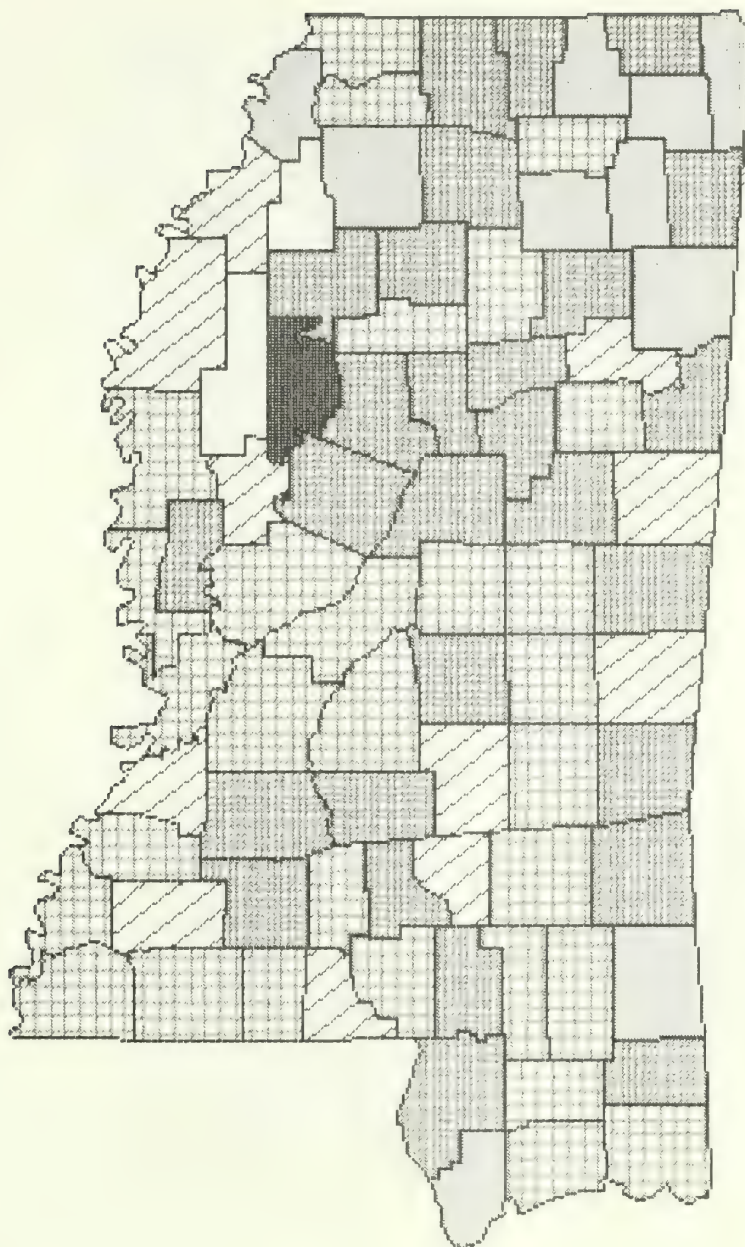


Figure 11.—*Percent timberland by county, poletimber stand-size class, Mississippi, 1987.*

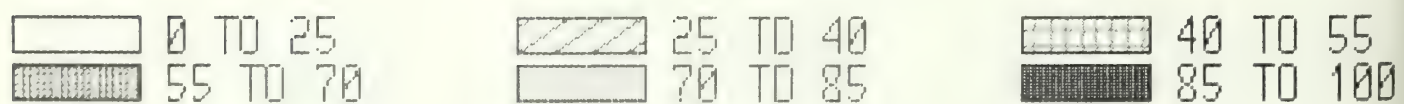
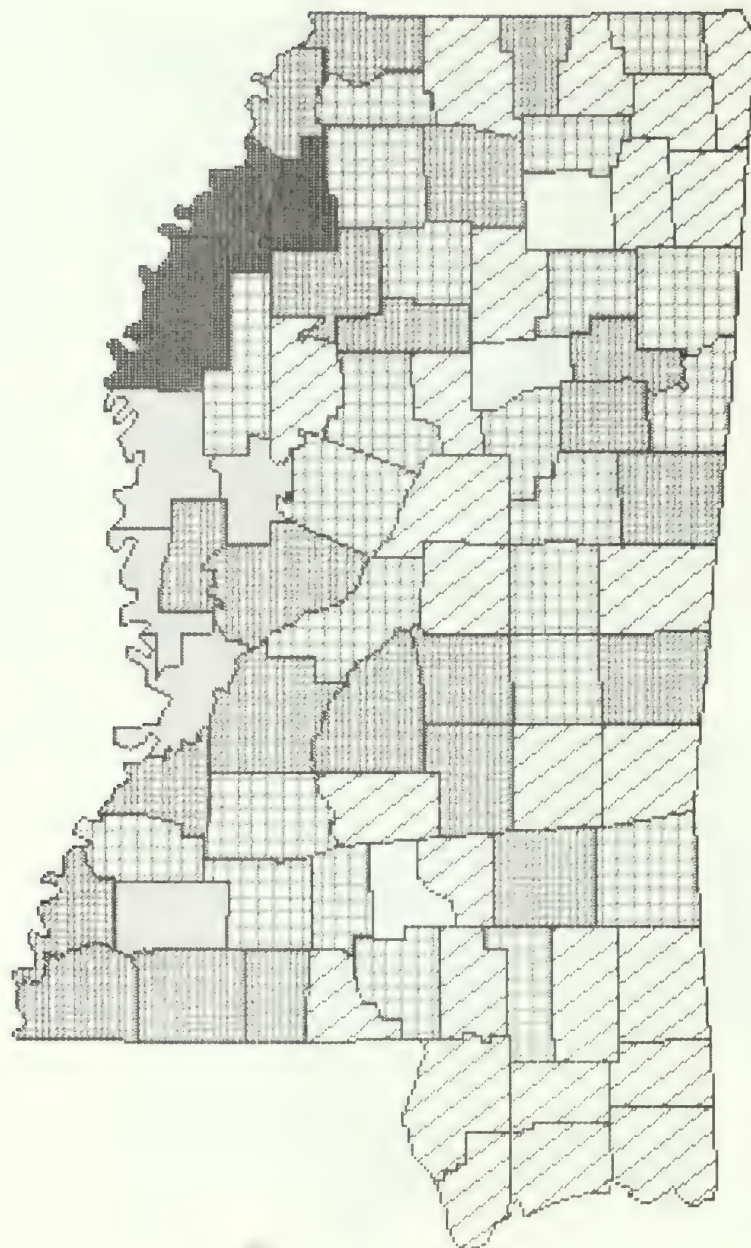
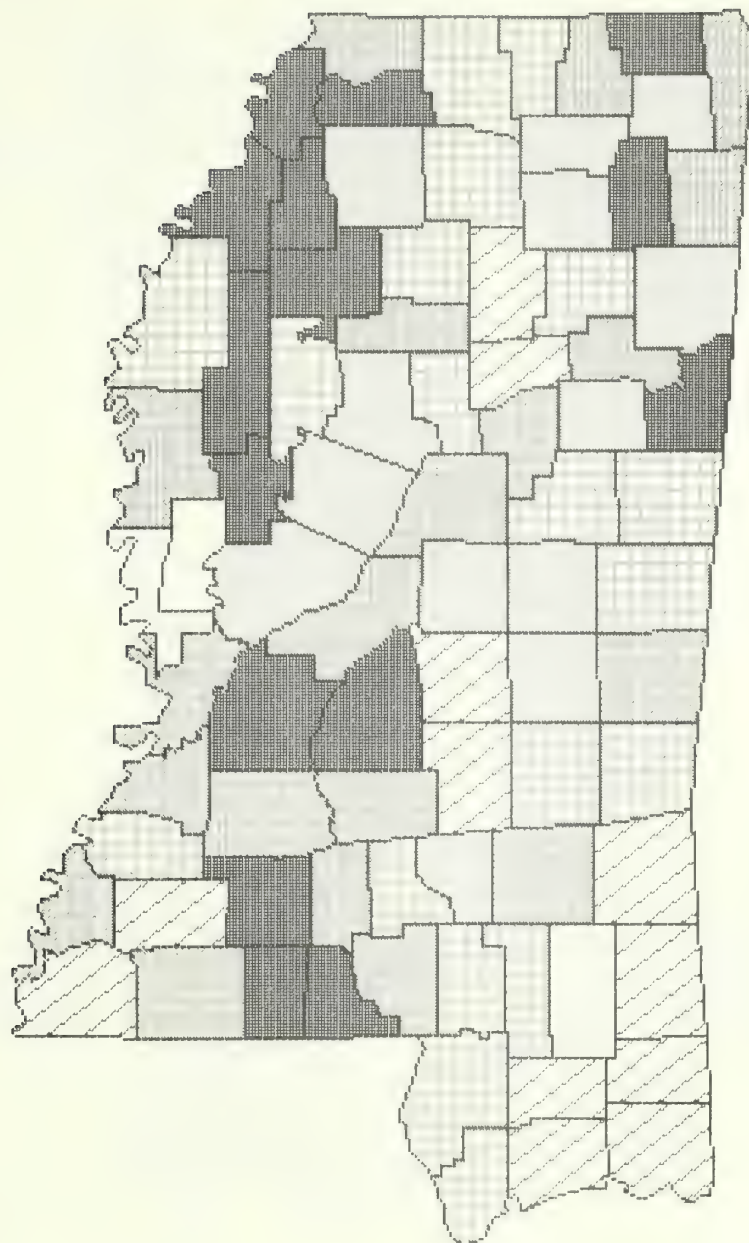
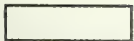
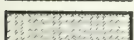
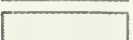


Figure 12.—*Percent timberland by county, sawtimber stand-size class, Mississippi, 1987.*



	0 TO 40
	70 TO 80

	40 TO 60
	80 TO 90

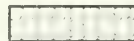
	60 TO 70
	90 TO 100

Figure 13.—*Percent timberland by county, nonindustrial private ownership class, Mississippi, 1987.*

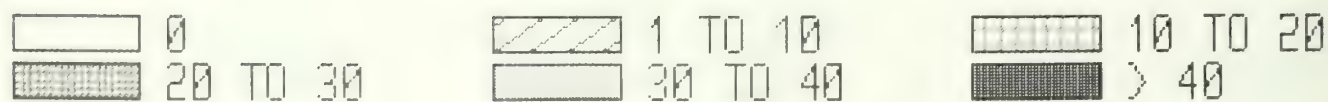
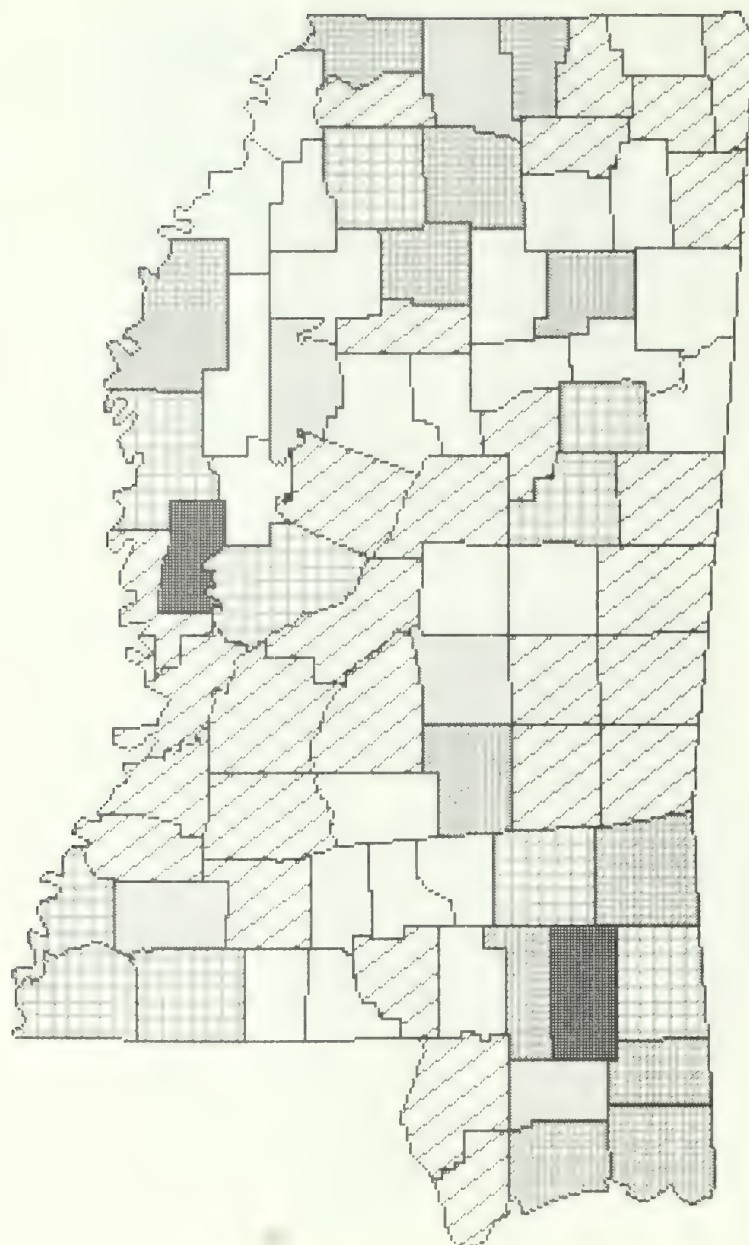


Figure 14.—*Percent timberland by county, public ownership class, Mississippi, 1987.*



Figure 15.—*Percent timberland by county, forest industry ownership class, Mississippi, 1987.*

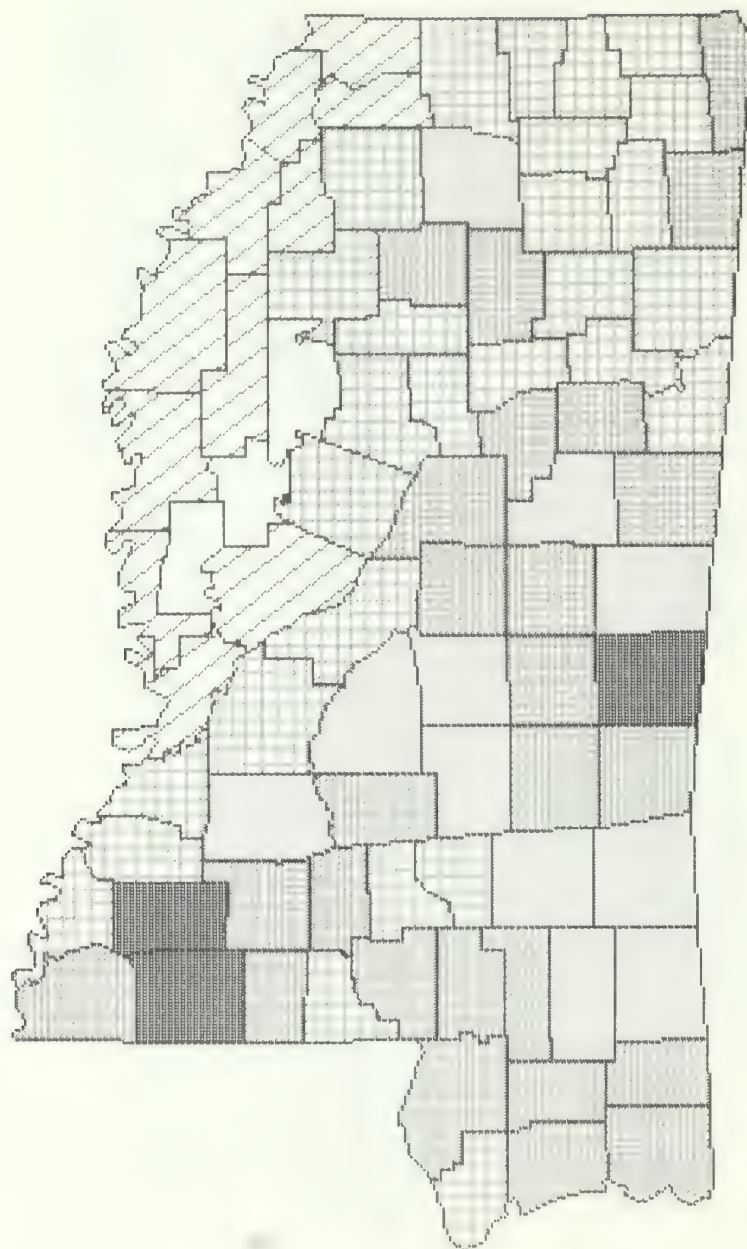


Figure 16.—*Softwood volume of growing stock by county, in million cubic feet, Mississippi, 1987.*

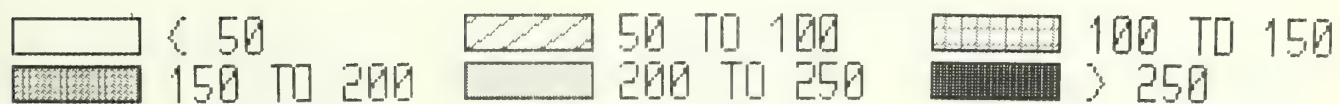
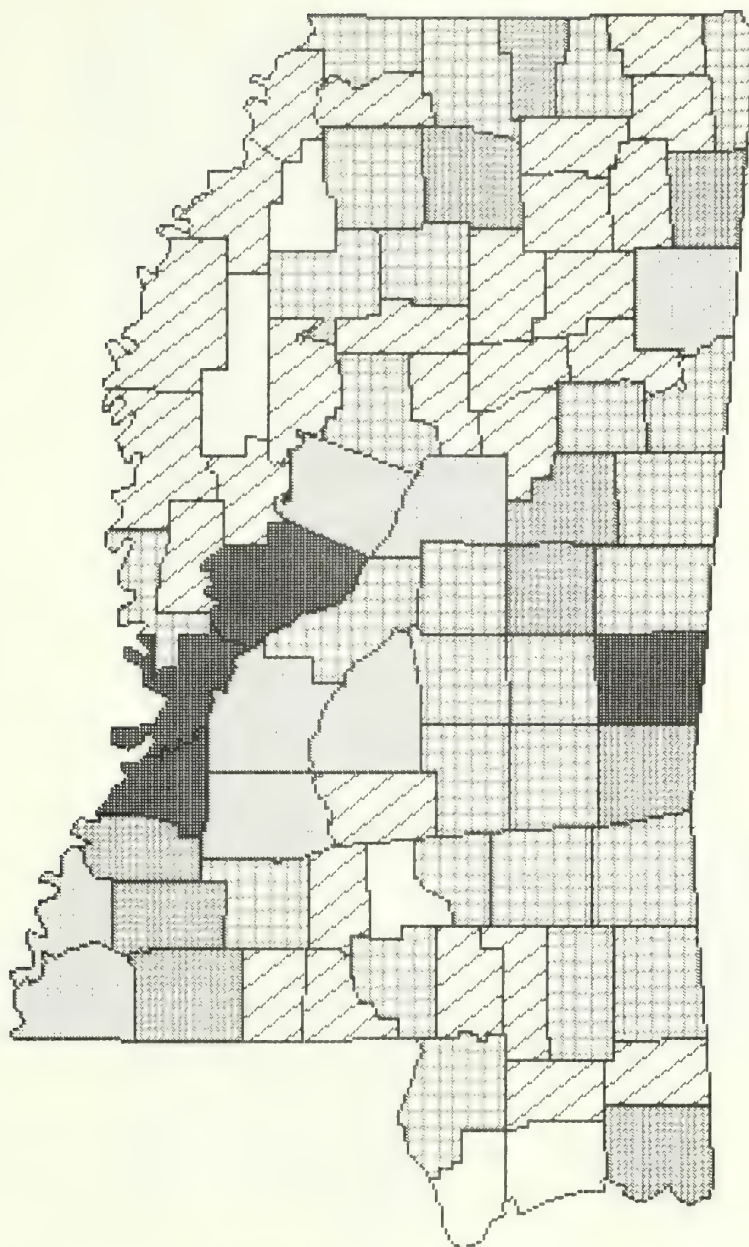


Figure 17.—*Hardwood volume of growing stock by county, in million cubic feet, Mississippi, 1987.*

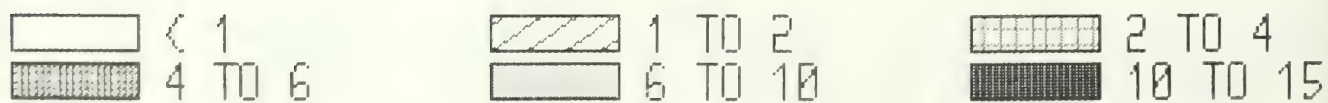
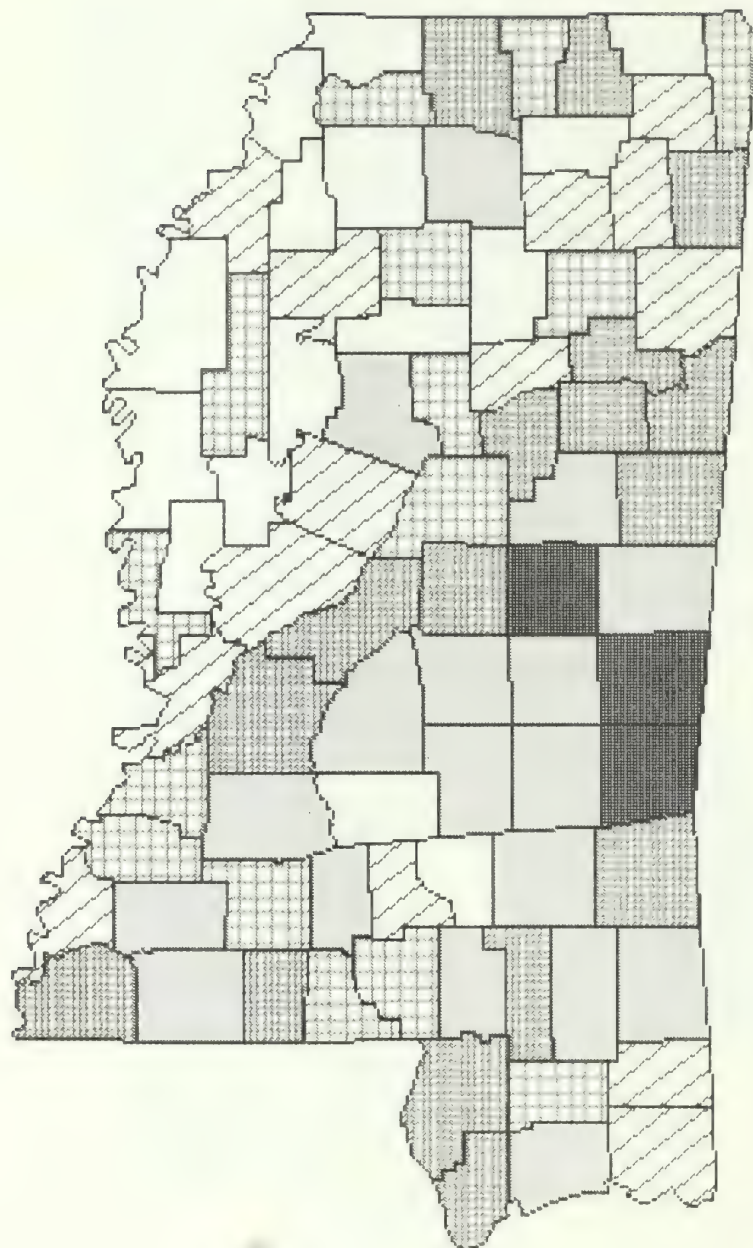


Figure 18.—*Softwood volume of rough and rotten trees by county, in million cubic feet, Mississippi, 1987.*



Figure 19.—*Hardwood volume of rough and rotten trees by county, in million cubic feet, Mississippi, 1987.*

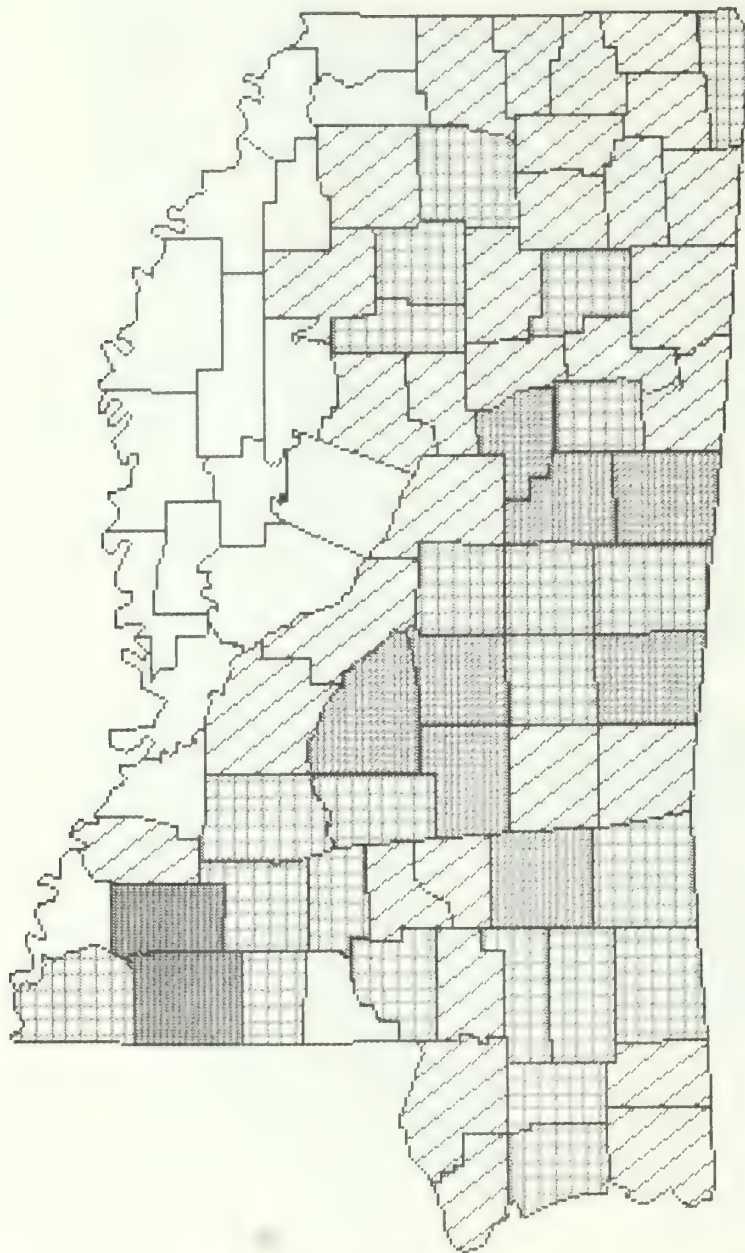


Figure 20.—Average softwood volume of growing stock on timberland by county, in cubic feet per acre, Mississippi, 1987.

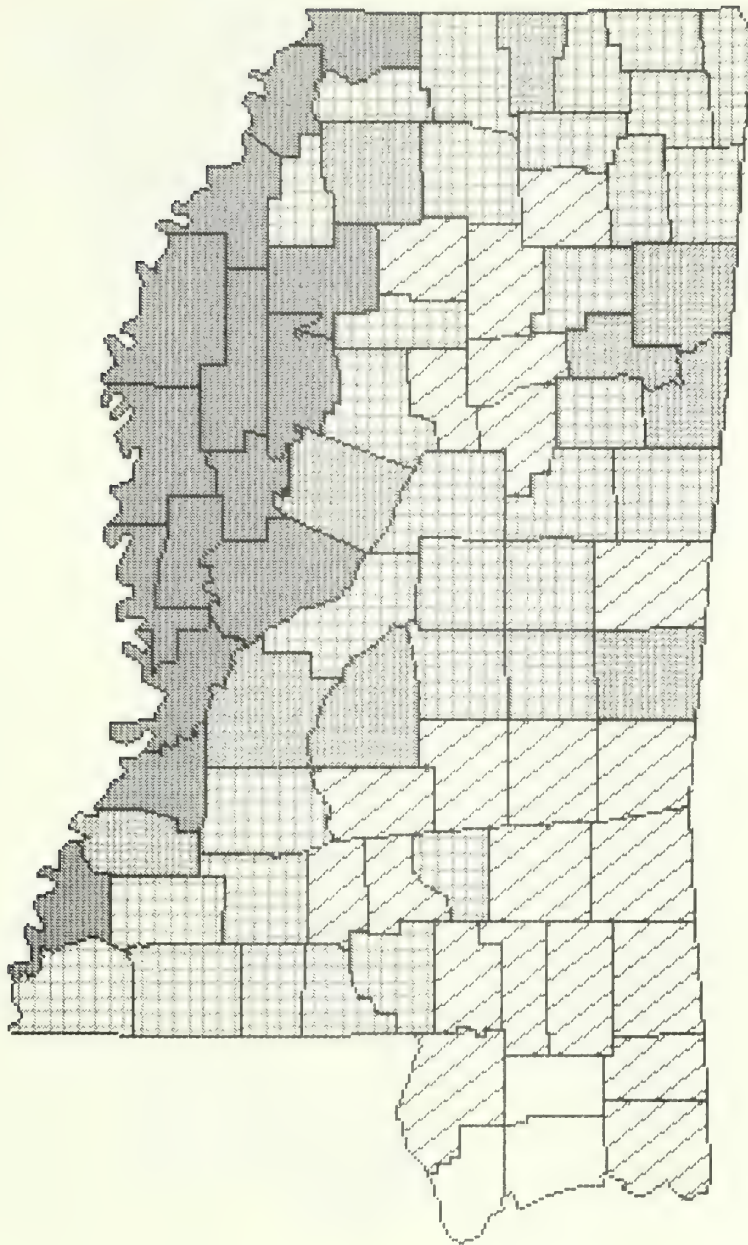


Figure 21.—Average hardwood volume of growing stock on timberland by county, in cubic feet per acre, Mississippi, 1987.

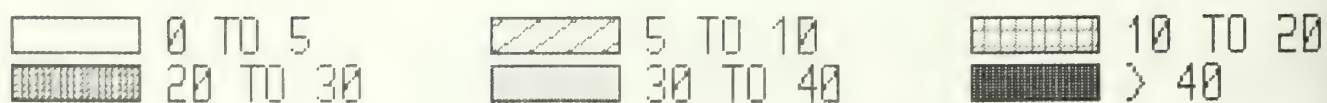
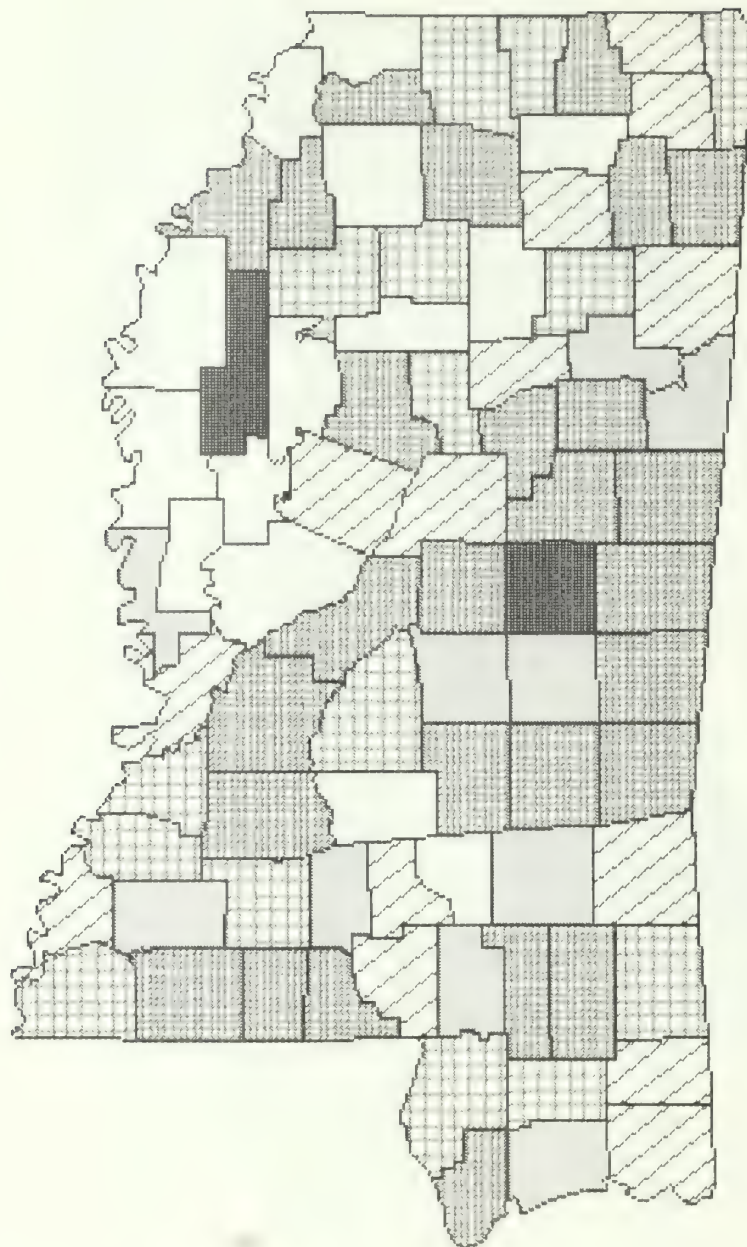


Figure 22.—Average softwood volume of rough and rotten trees on timberland by county, in cubic feet per acre, Mississippi, 1987.

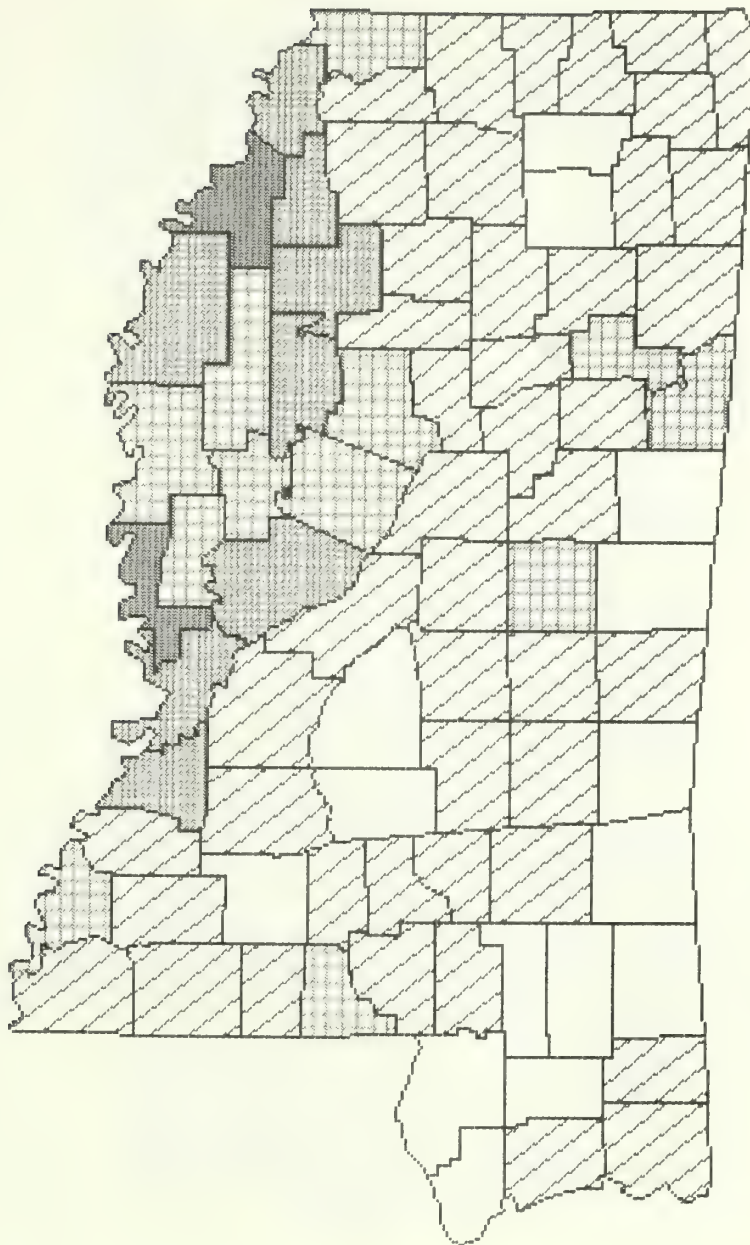


Figure 23.—Average hardwood volume of rough and rotten trees on timberland by county, in cubic feet per acre, Mississippi, 1987.

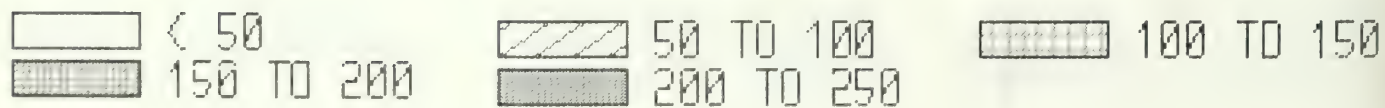
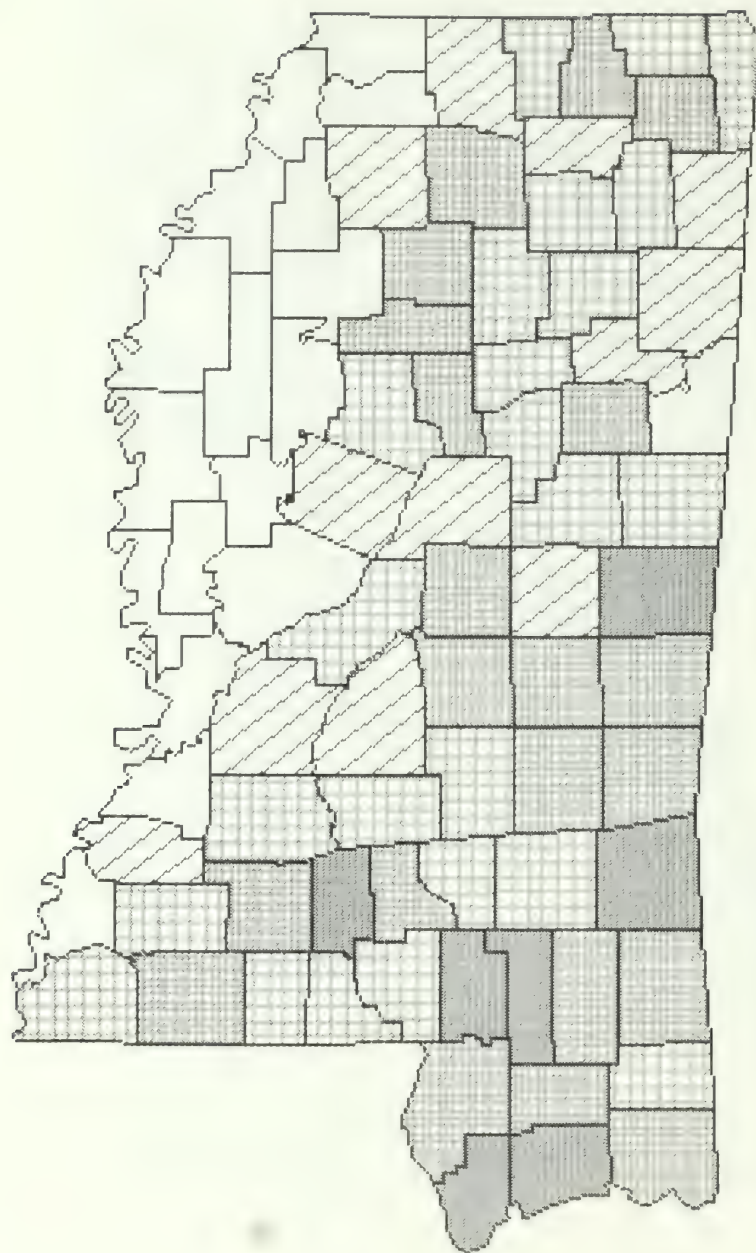


Figure 24.—Average number of live softwood trees per acre on timberland by county, Mississippi, 1987.

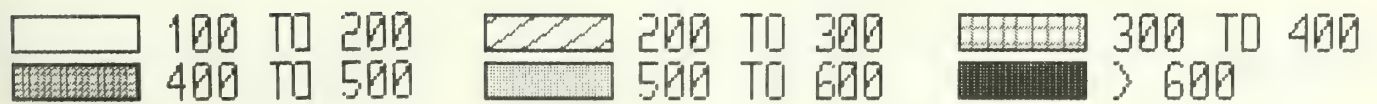
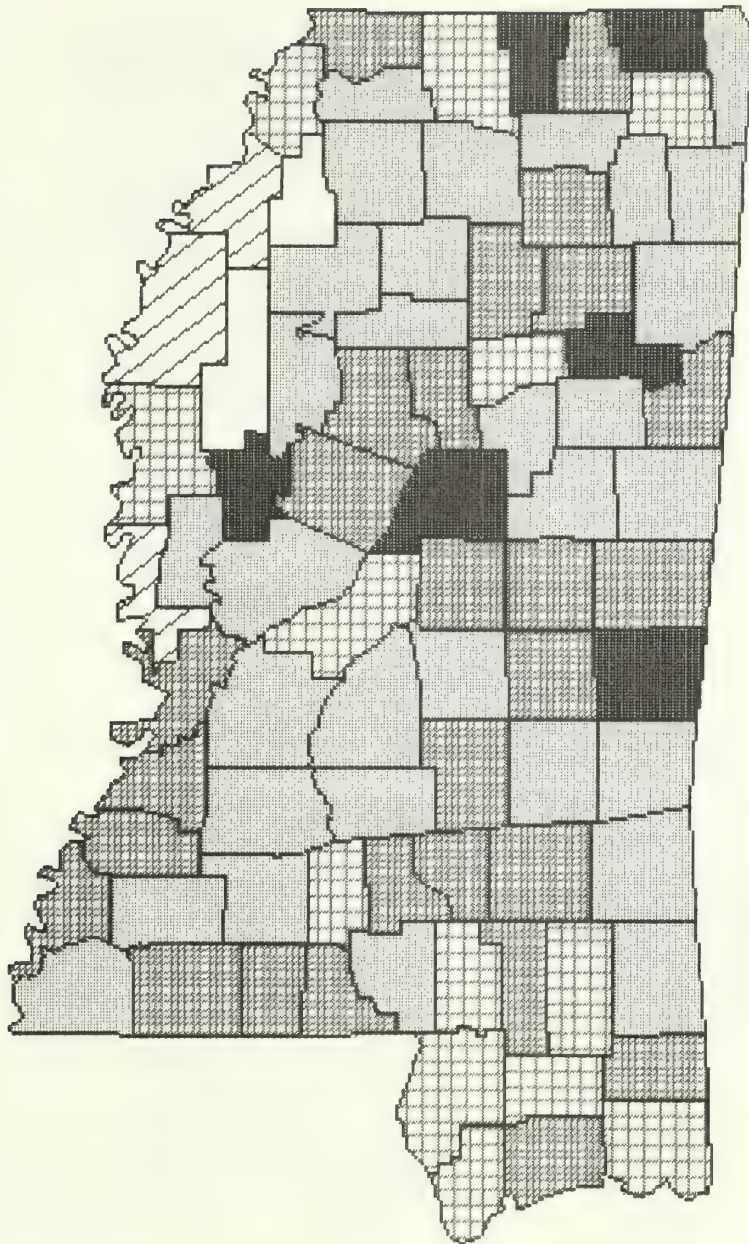


Figure 25.—Average number of live hardwood trees per acre on timberland by county, Mississippi, 1987.

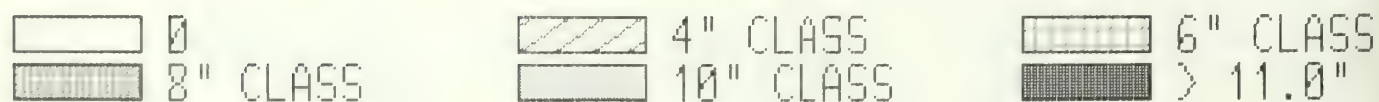
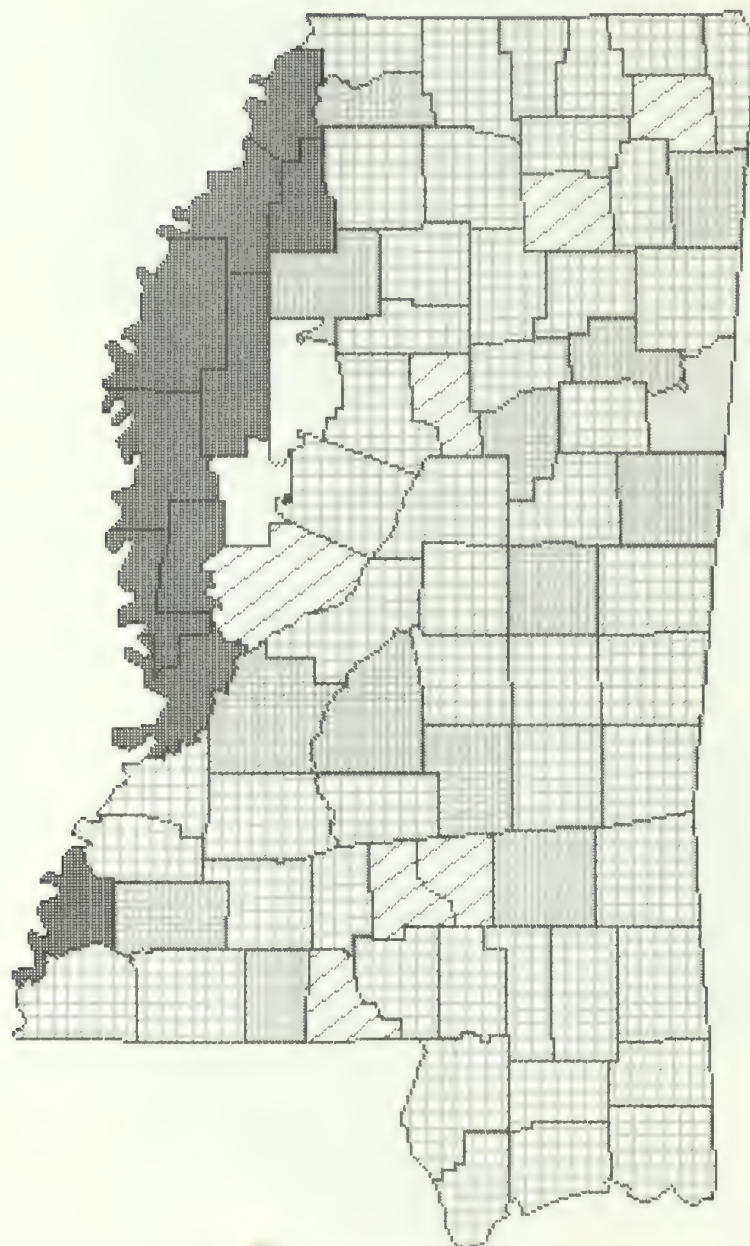


Figure 26.—Average softwood DBH by county, quadratic mean diameter in inches, two inch diameter classes, Mississippi, 1987. The "0" category indicates no softwood trees were tallied in that county.

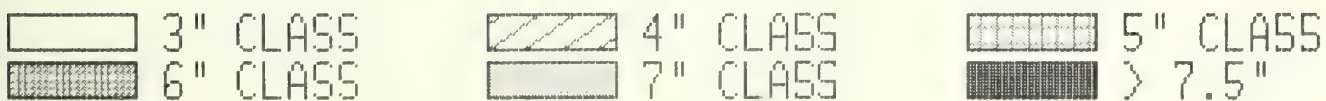
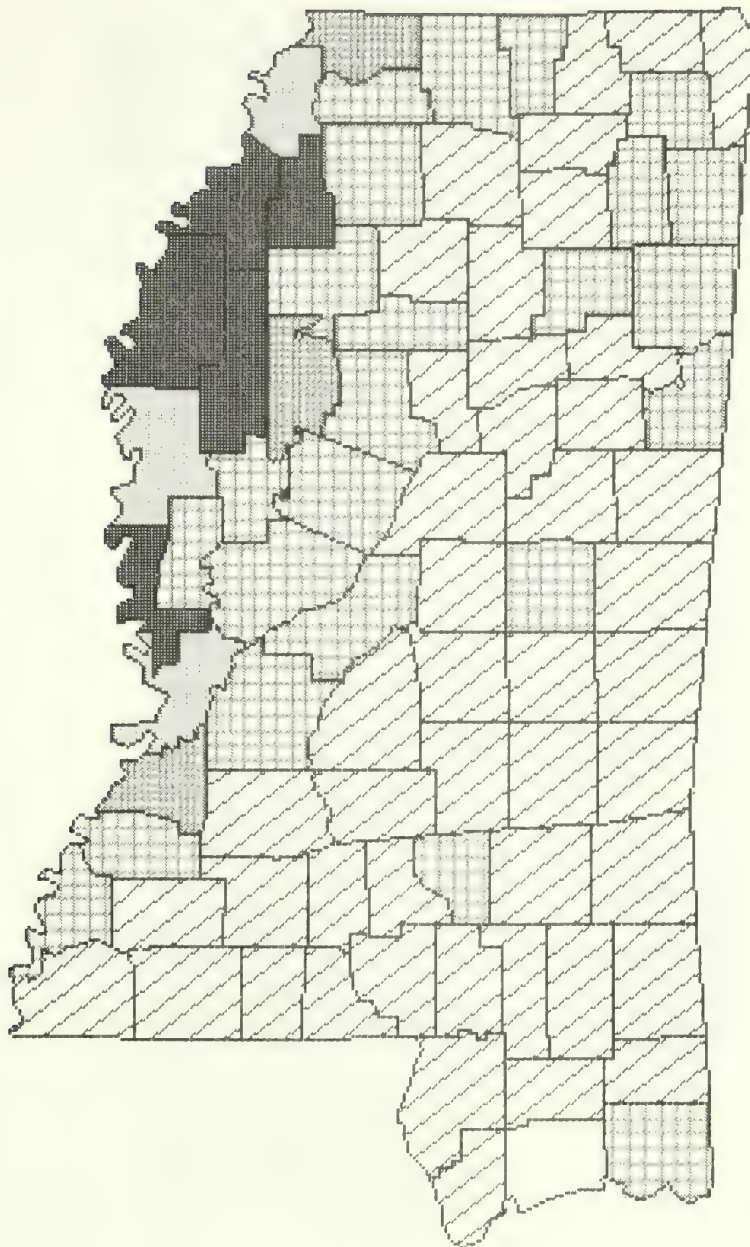


Figure 27.—Average hardwood DBH by county, quadratic mean diameter in inches, one inch diameter classes, Mississippi, 1987.

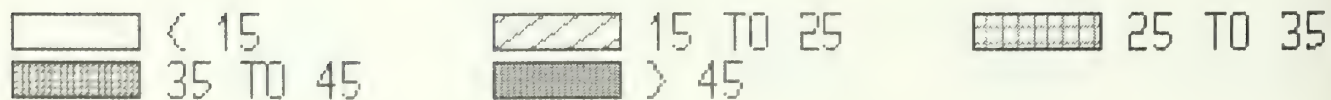
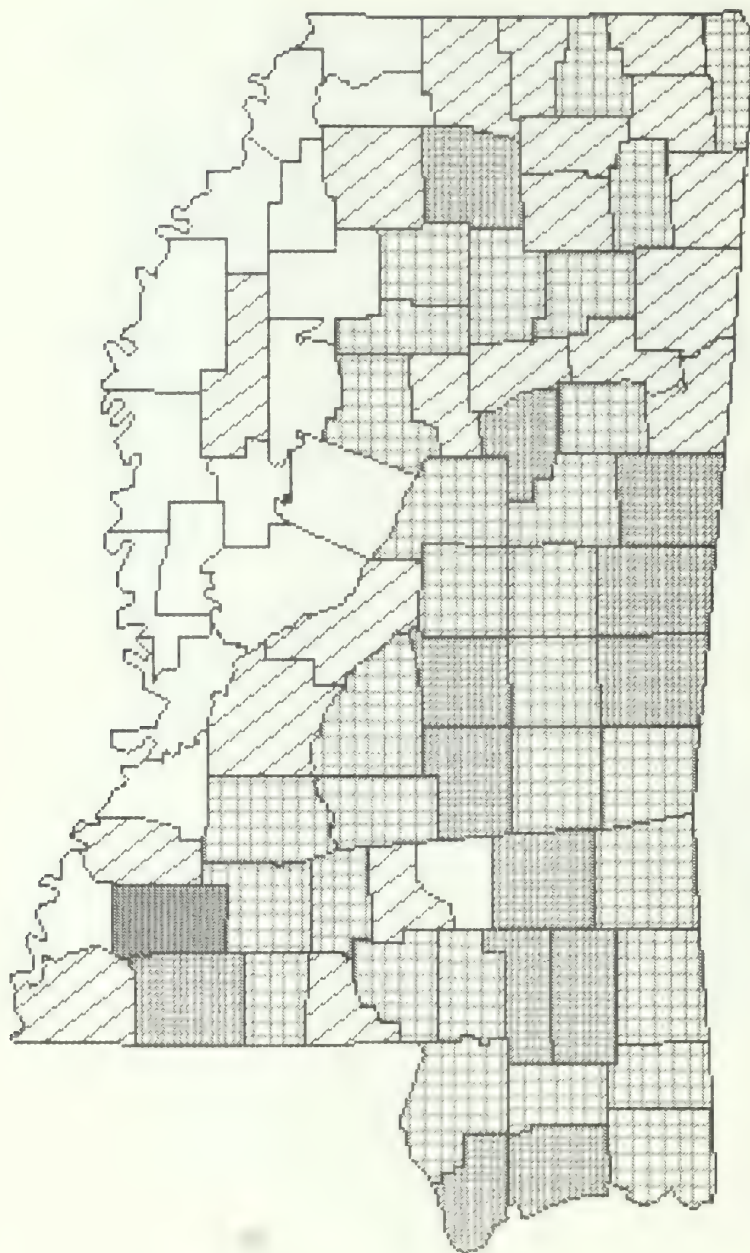


Figure 28.—Average softwood basal area per acre on timberland by county, in square feet, Mississippi, 1987.

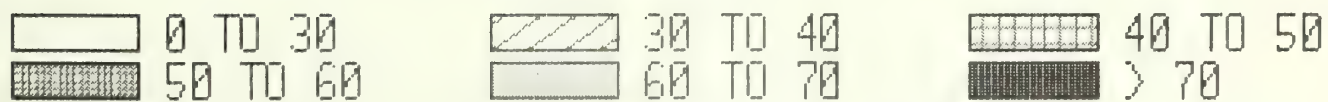
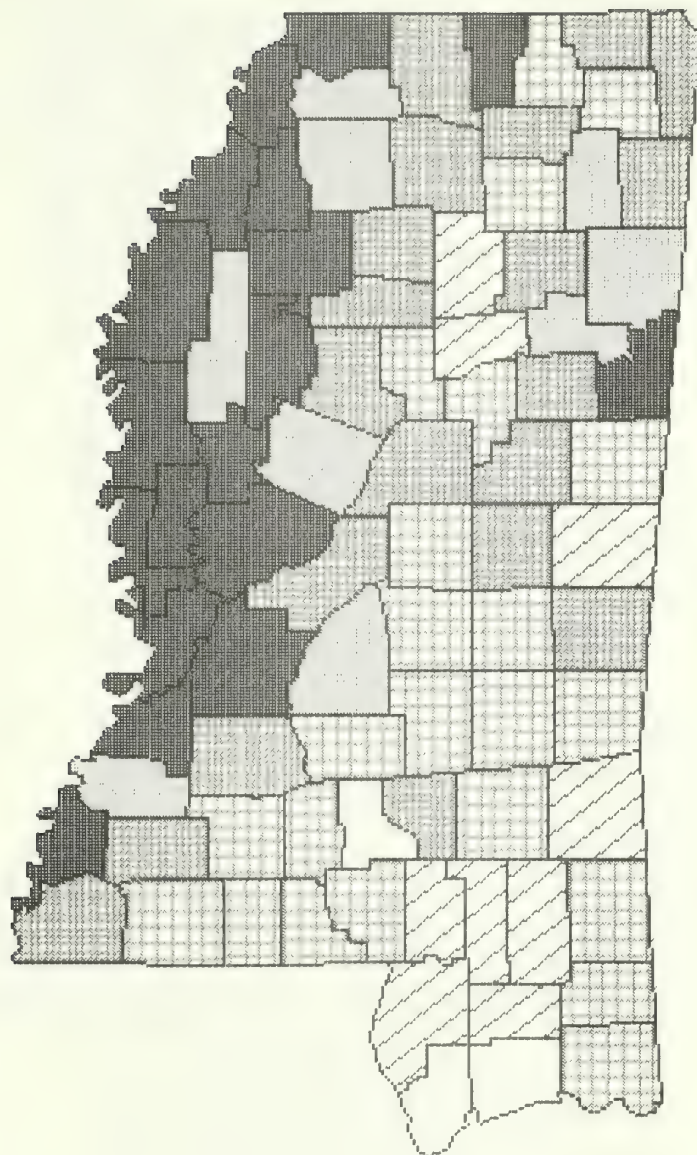


Figure 29.—Average hardwood basal area per acre on timberland by county, in square feet, Mississippi, 1987.

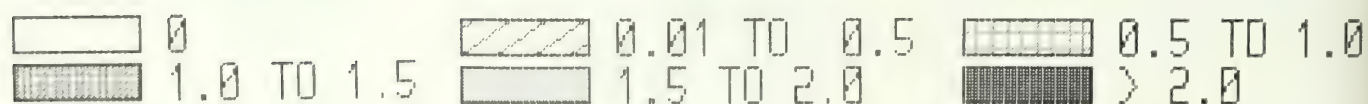
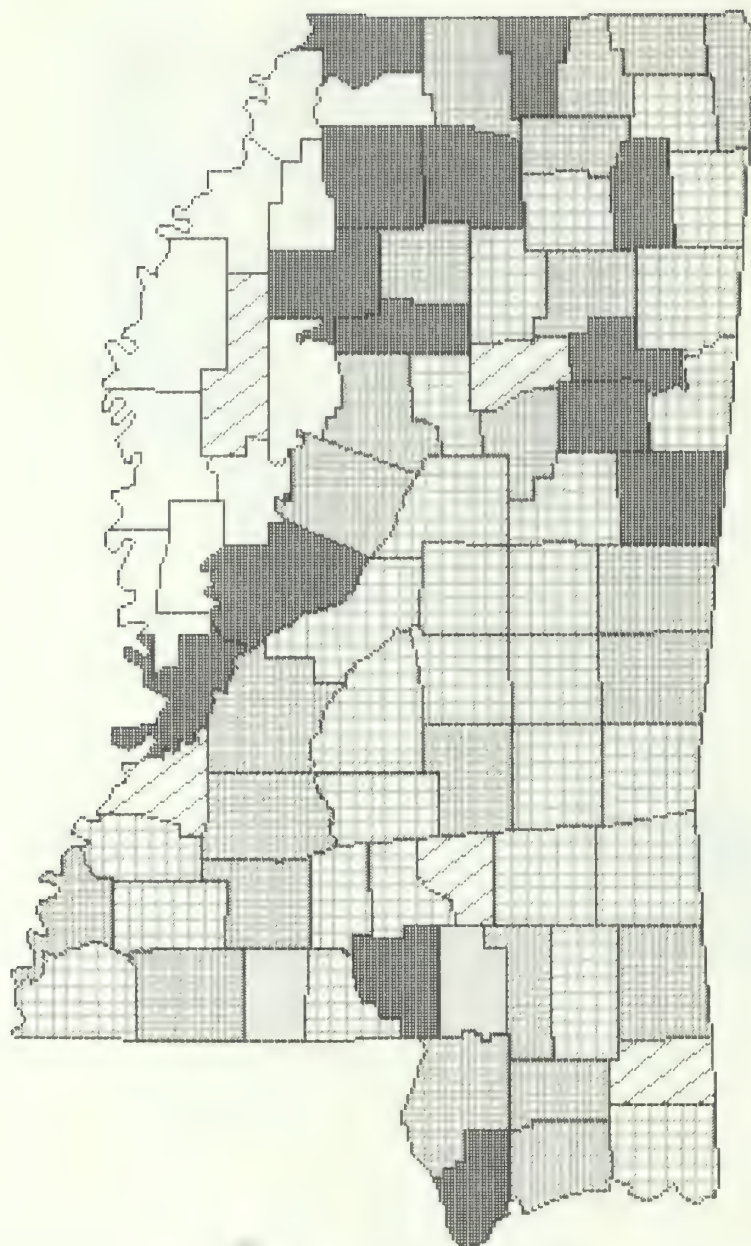


Figure 30.—Ratio of average net annual growth to average net annual removals of growing stock for softwoods by county, Mississippi, 1987. A value greater than 1.0 indicates more growth than removals; a value less than 1.0 indicates more removals than growth. The "0" category indicates a county in which not enough information was collected to give meaningful results (See Table 18).

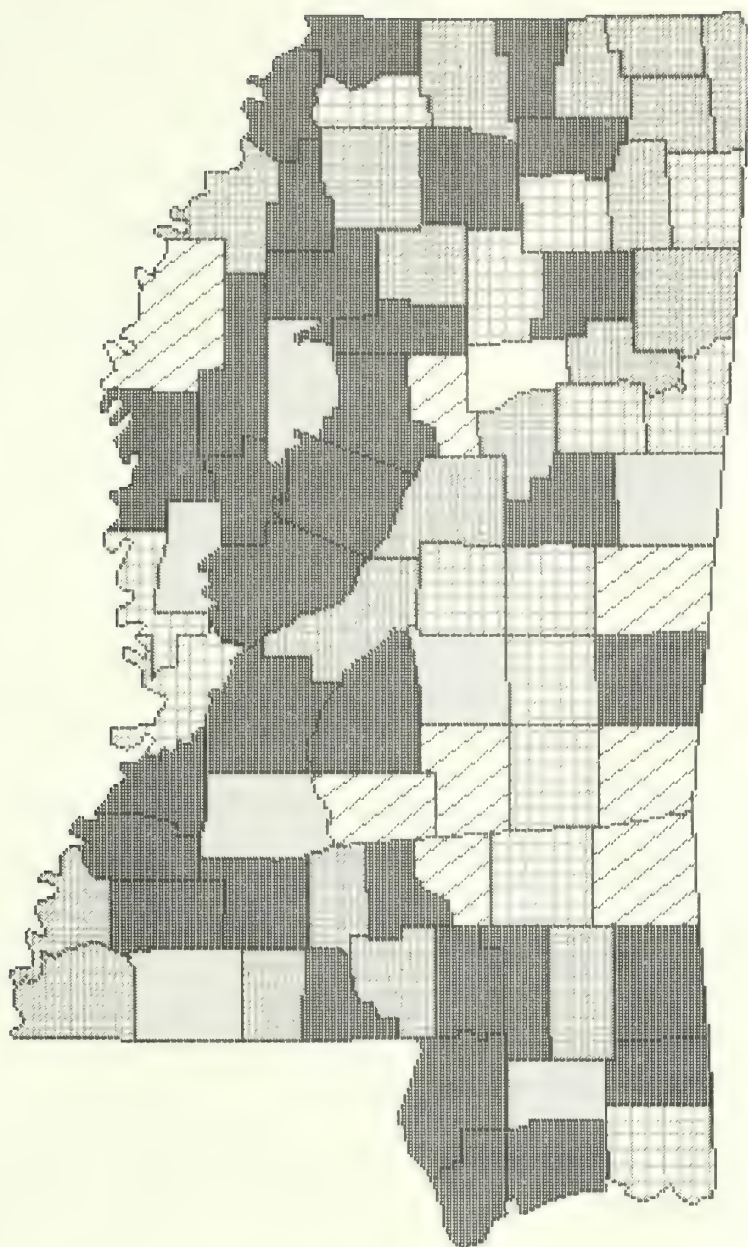


Figure 31.—Ratio of average net annual growth to average net annual removals of growing stock for hardwoods by county, Mississippi, 1987. A value greater than 1.0 indicates more growth than removals; a value less than 1.0 indicates more removals than growth.

Donner, Bryan L. and Hines, F. Dee, Forest Statistics for Mississippi counties—1987. Resource Bull. SO- 129 . New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 1987. 79 p.

Tabulates forest resource information from a new inventory of Mississippi counties.

Additional Keywords: Area, volume, forest type, stand size, ownership.





United States
Department of
Agriculture

Forest Service

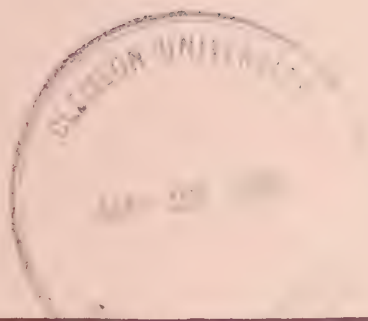
Southern Forest
Experiment Station

New Orleans,
Louisiana

Resource Bulletin
SO-130

Forest Resources of Louisiana

James F. Rosson, Jr., William H. McWilliams, Paul D. Frey



April 1988

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Forest Resources of Louisiana

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HIGHLIGHTS

This report documents the findings of the fifth forest survey of Louisiana. Trend data on the forest resource are presented along with appropriate tables and figures. The Appendix contains definitions of terms, a discussion of data reliability, a tree species list, and 22 standard statistical tables. Data are reported for January 1, 1984. Major highlights are listed below. Comparisons, unless otherwise noted are made between surveys conducted and dated January 1, 1974, and January 1, 1984.

- Total timberland has declined by 654,000 acres since 1974. Most of this acreage loss was in the North Delta and South Delta survey units. Louisiana currently has 13,872,600 acres of timberland.
- Most of the acreage declines are nonindustrial private timberland (804,400 acres). Forest industry timberland also declined, but only slightly. Public timberland increased, principally through State acquisition of bottomland areas. Currently in Louisiana, 64 percent of timberland is owned by nonindustrial private landowners, 26 percent by forest industry, and 10 percent by public agencies.
- The predominant forest type is oak-gum-cypress (4,377,600 acres) followed closely by loblolly-shortleaf (4,033,200 acres). The oak-gum-cypress forest type experienced a 579,000 acre decline. No significant change occurred in the loblolly-shortleaf forest type. The longleaf-slash forest type acreage declined 9 percent.
- Most of Louisiana's timberland is occupied by sawtimber stands (8,178,900 acres). Acreage of poletimber and, sapling and seeding stands declined significantly (a 1,076,200-acre drop). More than 449,000 acres are in a nonstocked condition.
- Total growing-stock volume is 18,992 million cubic feet, a 14 percent increase. Fifty-six percent

of the volume is in softwoods. Total sawtimber volume is 70,735 million board feet, a 16 percent increase. Sixty-four percent of the volume is in softwoods.

- Softwood growing-stock volume is 10,552 million cubic feet, a 17 percent increase. Sawtimber volume is 45,445 million board feet, a 23 percent increase.
- Hardwood growing-stock volume is 8,440 million cubic feet, a 10 percent increase. Sawtimber volume is 25,290 million board feet, a 6 percent increase.
- Cull volume has increased by 23 percent and currently stands at 3,031 million cubic feet. Of cull volume 87 percent is in hardwood trees.
- Loblolly pine is the most dominant tree in the State, comprising 62 percent of the softwood growing-stock volume and 35 percent of total growing-stock volume. Baldcypress, shortleaf pine, slash pine, and longleaf pine follow, making up 14, 11, 7, and 4 percent, respectively, of softwood growing-stock volume.
- Oaks are dominant among hardwood species, comprising 36 percent of hardwood growing-stock volume. Other major constituents are sweetgum, tupelos, hickories, ashes, and willows at 19, 14, 6, 5, and 4 percent, respectively, of hardwood growing-stock volume.
- More trees are in larger sizes. The number of trees and growing-stock volumes have increased in every diameter class above 8 inches.
- Optimally stocked timberland is currently 5,850,000 acres, a 1,422,500 acre decline. Overstocked and understocked acreage is currently 3,964,100 and 4,058,500 acres, respectively. Understocked acreage has increased by 777,200 acres.
- Gross growth for softwood growing stock is 43.2 cubic feet per acre per year, down slightly. Hardwood growing-stock gross growth is 26.5 cubic feet per acre per year, also down slightly.

- Net growth of softwood growing-stock is 39.3 cubic feet per acre per year, down 6 percent. Hardwood growing-stock net growth is 21.2 cubic feet per acre per year, down 5 percent.
- Net change of softwood growing stock is +8.2 cubic feet per acre per year, down 27 percent from the 1974 rate. Hardwood growing-stock net change is +8.3 cubic feet per year, also down 27 percent.
- Gross growth of softwood sawtimber is 205.4 board feet per acre per year, a 7 percent increase. Hardwood sawtimber gross growth is 93.6 board feet per acre per year, down slightly.
- Net growth of softwood sawtimber is 193.0 board feet per acre per year, a 6 percent increase. Hardwood sawtimber net growth is 78.6 board feet per acre per year, down slightly.
- Net change of softwood sawtimber is +55.8 board feet per acre, up 56 percent from the 1974 rate. Hardwood sawtimber net change is +38.9 board feet per acre, a 37 percent increase.
- Removals of softwood growing stock total 432 million cubic feet per year. Hardwood growing-stock removals are 178 million cubic feet per year.
- Removals of softwood sawtimber total 1,904 million board feet per year. Hardwood sawtimber removals are 550 million board feet per year.
- Mortality of softwood growing stock is 55 million cubic feet per year, a 38 percent increase. Mortality of hardwood growing stock is 74 million cubic feet per year, a 7 percent increase.

INTRODUCTION

This report summarizes the findings of the fifth Louisiana forest survey by the Forest Inventory and Analysis Work Unit (FIA) of the Southern Forest Experiment Station. Previous surveys were conducted in 1936 (Winters et al. 1943), 1954 (U.S. Department of Agriculture 1955), 1964 (Sternitzke 1965), and 1974 (Murphy 1975).

Louisiana is subdivided into five forest survey units (fig.1): North Delta (unit 1), South Delta (unit 2), Southwest (unit 3), Southeast (unit 4), and Northwest (unit 5). These divisions facilitate data compilation and field work because unit boundaries are correlated fairly closely with physiographic and vegetative regions of the State.

Field work began on February 28, 1983, and ended on February 4, 1985. In all, 4,471 sample plots, systematically distributed throughout the State on a three-mile square grid, were visited by field crews. A total of 2,365 of these plots were forested and had tree

measurements taken. Another 2,200 plots interspersed in the three-mile grid were ground-checked as to forest or nonforest condition. These ground checks enhanced the statistical reliability of the timberland area estimate.

Field personnel measured 50,917 trees, which included 75 commercial tree species, 17 noncommercial tree species, and several miscellaneous noncommercial tree species. The miscellaneous species occur infrequently and were lumped into one category. There were 25 plot description variables, 31 tree measurement variables, and 21 nontimber variables assessed on the sample plots by field crews.

Individual unit reports were published prior to this report and may be consulted for more detailed regional statistics (Rosson and Bertelson 1985, Rosson and Bertelson 1986a, Rosson and Bertelson 1986b, Rosson and Bertelson 1986c, Rosson and Bertelson 1986d). In addition, parish statistics for the entire State have also been published (May and Bertelson 1986). A forthcoming publication will address the other forest resources of Louisiana.

The Forest Service was mandated by law (McSweeney-McNary Act of 1928) to conduct periodic assessments of the Nation's forest resources. Recently, the assessment emphasis was expanded and broadened by the Renewable Resources Planning Act of 1974, the National Forest Management Act of 1976, and the Forest and Rangeland Renewable Resources Research Act of 1978 (this last act effectively cancels the 1928 McSweeney-McNary Act). These acts ensure the availability of adequate data to determine ways of balancing the demand and supply factor for forestland resources, benefits, and uses that the American people need.

HISTORY

The area of what is now the State of Louisiana came into possession of the United States in 1803 as a part of the Louisiana Purchase. In 1810 the federal government opened the southern states' lands, including Louisiana, to public sales. Because of the remoteness of Louisiana and vastness of the timber resource, only local residents acquired sizeable amounts of land. These people remained on or acquired only cleared land because it was extremely difficult both physically and financially to bring forested land under cultivation. In the early part of the 19th century small mills only nibbled at the edge of Louisiana's timber resource—mostly for local use.

The 1850's brought a substantial increase in southern lumbering operations, and with it came more and more outside buyers of timberland. In 1866, the Southern Homestead Law was passed, its purpose being to restrict entry of outsiders and to favor local set-



Figure 1.—The forest survey units in Louisiana.

tlers. Lumber demand continued to increase and timber speculators were beginning to turn more and more of their attention to the forest resource in the South. After bitter congressional fighting, the Homestead Law was revised in 1876 and this, in effect, opened the door to the southern timberlands to many timber buyers. Millions of acres of virgin timberland were bought for \$1.25 an acre. In Louisiana, northern purchasers bought well over 1 million acres between 1800 and 1888. With fears raised that timber monopolies would own the South, Congress passed another law in 1889 which again restricted homesteading to local people. Meanwhile, a substantial title to the major resource of Louisiana had transferred to absentee mill owners (Clark 1984, Cowdrey 1983).

As the Nation's northeastern and northcentral forests were being rapidly depleted, the center of the lumbering industry shifted to the South. In Louisiana, the era of heaviest cutting occurred between 1880 and 1937. During that 57-year period, more than 120 billion board feet of lumber was produced. In 1880, Louisiana ranked 13th in lumber production but by 1914 led the nation with an annual cut of 4 billion board feet.

The pace of cutting in Louisiana at the turn of the century was frantic. The focus was to haul logs from the forest and deliver lumber to purchasers anywhere they could be found. No thought was given to future forest resources. The removal of vast virgin stands of timber could have led to the total collapse of the resource had it not been for the inspiration and ingenuity of Henry Hardtner of Urania, Louisiana (Clark 1984). Hardtner was a timberman and mill operator who knew that the disastrous rate of depletion would close the lumbering industry permanently in just a few years. He pioneered efforts in establishing a saw dimensional scale to guide his loggers; he ordered 3 or 4 seed trees left on each acre logged; he demanded more careful logging procedures; and he protected stands from wild hogs and fire.

Historically, Hardtner's greatest accomplishment occurred when he was a Senator in the Louisiana General Assembly where, along with many other legislative initiatives, he promoted the 1912 tax-deferral law. That action provided that forestland devoted to reforestation would be assessed at a fixed annual rate for 20 years. As the timber was cut, the owner was assessed at an established severance tax rate.

By 1924, Hardtner's mill at Urania was sawing second-growth fixed-assessment timber. But more important, many other landowners were beginning to consider such management practices. Still, despite Hardtner's efforts, many large lumber companies still vacated vast expanses of forestland after cutting. By 1936, Louisiana's inventory had been reduced to 41 billion board feet.

In the mid-1920's, the forest industry in Louisiana was experiencing a serious downturn. Saw logs were being quickly depleted and there was no certainty of a profitable second forest ever being grown for sawtimber products. It had been predicted that the virgin forests would be cut and gone by 1940, but by 1930 the onset of the Great Depression substantially reduced the demand for timber. The wooden ship building era had passed; automobile manufacturers no longer used wood for wheels, bodies, and trim; the wagon and carriage industries were closed; the huge initial demand for railroad ties, telegraph, and light poles had been met.

By 1930, despite the downturn in demand, the South and Louisiana were left with a cut-over forest of varying dimension but dominated by smaller sized trees. For the forest industry to survive, it had to utilize this smaller sized resource. The kraft and sulphite paper processes had been developed and were in use but many thought that shopping and grocery bags, cardboard boxes, etc. would not support a full-fledged industry alone. The first kraft plant in Louisiana, at Bogalusa, began operation in 1918 but used only a small portion of the resource. Research, meanwhile, had developed a process to neutralize and bleach the resin in southern pines and in 1940 the first plant to run newsprint in commercial quantity was started in Lufkin, Texas (Clark 1984). Other mills came on line across the South and by 1953 pulpwood production accounted for 50 percent of total softwood output in Louisiana. The 1950's also brought the beginning of the clearing of bottomland hardwoods in the Mississippi River Delta, but despite this, Louisiana still had more hardwood volume than any other State.

During the 1960's Louisiana continued to increase its pulp and paper capacity but lost its position as the no. 1 hardwood State. Meanwhile, seven plywood plants had been planned or were under construction in 1964.

In the 1970's, Louisiana was the leading softwood plywood producer in the Midsouth. Increasing inventories of second and third growth pine had attracted 13 veneer mills to the State.

Today in Louisiana, forest industry is second behind the petrochemical industry in employment. Despite a continued shrinking of the resource land base, inventory volumes are increasing and it appears that the balance between growth and drain is still on the positive side.

FOREST AREA

The total land base for Louisiana is 28,493,700 acres. Of this, 14,611,000 acres are classified as agriculture, urban, residential, highways and other rights-of-way, and small wooded lots of strips too small

or narrow to meet forest survey definitions. The remaining 13,882,700 acres are forested, with 10,100 of these acres classed in productive-reserved status. Productive-reserved forestlands occur in Claiborne, Natchitoches, Rapides, Webster, and Winn parishes. This leaves 13,872,600 acres of Louisiana land classed as timberland (see definitions in Appendix).

The current timberland estimate is 654,000 acres less than that reported in 1974. Since the first survey in 1936, Louisiana has lost 2,283,300 acres of timberland. All but one of the forest survey units show a loss of timberland since the first survey. The exception is the Northwest unit (table I). That unit's acreage has increased every survey period except the 1984 and 1974 surveys in which 50,500 and 233,700 timberland acres, respectively, were diverted.

Of the 2,283,300 acres of timberland lost since 1936, 2,136,700 acres were in the North Delta and South Delta units alone. This is 94 percent of all timberland acreage losses in the State since the first survey. The Northwest unit helped offset total lost acreage by gaining 1,027,800 acres between 1936 and 1964, primarily by reversion of agricultural land to timberland.

Since the 1974 survey, every unit has lost timberland. The losses range from a high of 264,900 acres in the North Delta to 35,100 acres in the Southeast unit. Although timberland acreage losses are reported in every unit, land use does shift both ways. While some nonforest land is reverting back to timberland, some timberland is diverting to nonforest use. During the survey period between 1974 and 1984, Louisiana lost more timberland than it gained (table II). A total of 1,219,200 acres were diverted, 660,900 to agricultural use. The other 558,300 acres were diverted to more permanent nonforest uses such as urban and municipal areas, rights-of-way, etc., areas not easily or likely to be reclaimed as timberland any time in the foreseeable future. Of the 565,300 reverting acres, 431,500 were from abandoned agriculture land and most of the remaining 133,800 acres were from abandoned rural home-places.

At the parish level, three parishes each gained more than 20,000 acres of timberland (fig. 2). Conversely, 13 parishes each lost more than 20,000 acres of timberland. As noted previously, the majority of gains were in the Northwest unit and the losses in the Delta units.

Table I.—*Timberland area, Louisiana, 1937-1984*¹

Forest survey units	Survey date				
	1936	1954	1964	1974	1984
----- Thousand acres -----					
North Delta	2,440.3	2,171.3	1,894.8	1,178.4	913.5
South Delta	3,001.2	2,819.6	2,750.9	2,573.1	2,391.3
Southwest	4,972.0	4,874.5	4,822.3	4,538.4	4,416.8
Southeast	2,086.1	2,002.8	1,884.4	1,786.3	1,751.2
Northwest	3,656.3	4,169.8	4,684.1	4,450.4	4,399.9
All units	16,155.9	16,038.0	16,036.5	14,526.6	13,872.6

¹ Rows and columns may not sum due to rounding.

Table II.—*Changes in timberland by forest survey units, Louisiana, 1974-1984*¹

Forest survey units	Total land ²	Timberland	Change	Additions from:			Diversions to:		
				Total	Agriculture	Other ³	Total	Agriculture	Other ³
----- <i>Thousand acres</i> -----									
North Delta	3,515.5	913.5	−264.5	52.7	42.2	10.5	317.6	284.8	32.9
South Delta	9,629.4	2,391.3	−181.8	166.3	83.2	83.2	348.1	152.8	195.3
Southwest	6,665.4	4,416.8	−121.6	72.2	72.2	0.0	193.8	96.5	97.3
Southeast	2,762.7	1,751.2	−35.1	100.3	73.5	26.7	135.4	43.3	92.1
Northwest	5,920.7	4,399.9	−50.5	173.8	160.4	13.4	224.3	83.4	140.8
All units	28,493.7	13,872.7	−653.9	565.3	431.5	133.8	1,219.2	660.9	558.3

¹ Rows and columns may not sum due to rounding.

² United States Department of Commerce, Bureau of the Census, 1980.

³ Includes urban, industrial, highway, noncommercial forest, water, rights of way, and other land uses.

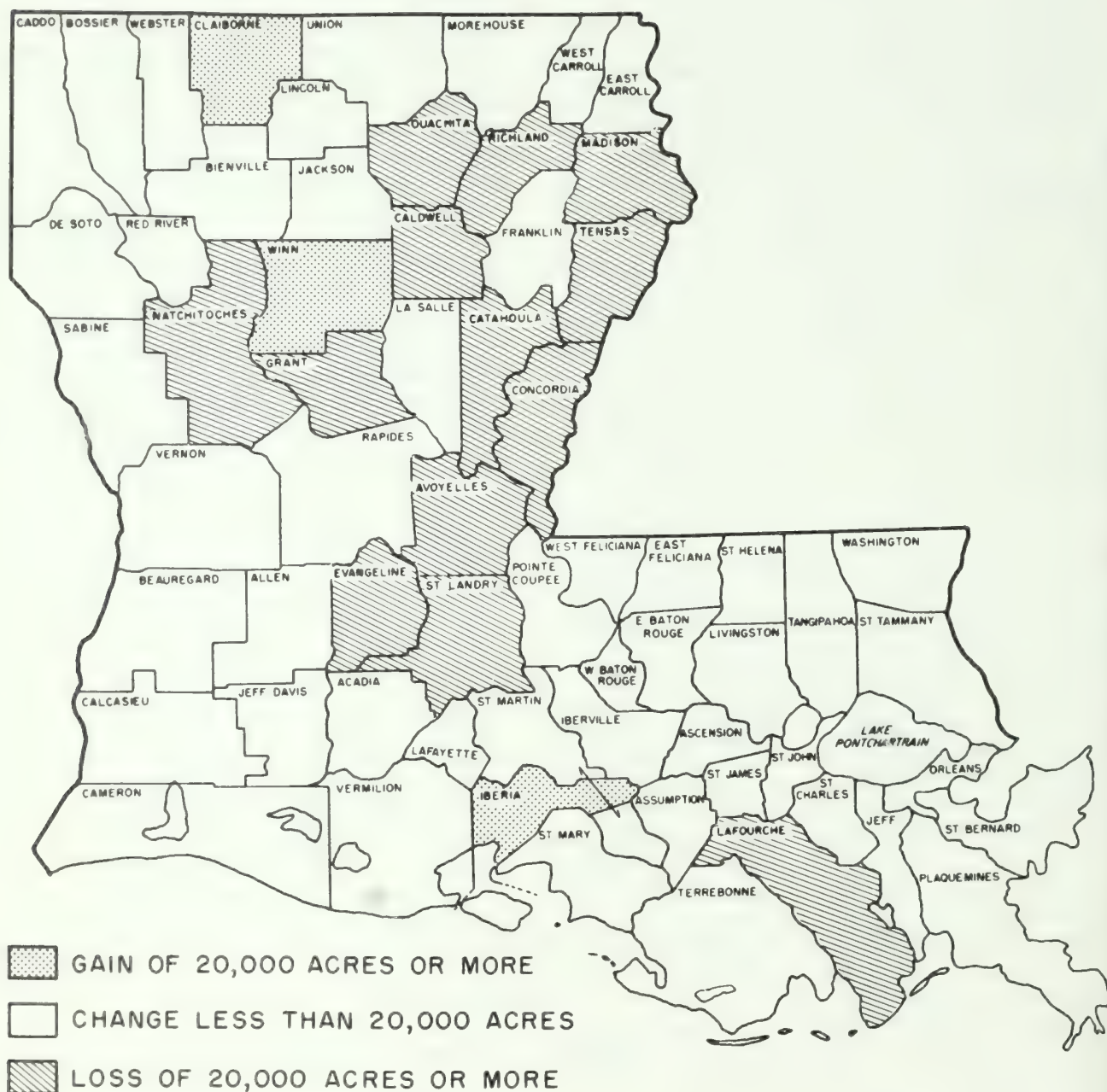


Figure 2.—Louisiana parishes with gains and losses in timberland from 1974 to 1984.

The survey period between 1964 and 1974 was the era when land clearing of bottomland hardwoods in the Mississippi Delta was peaking. During that period, 716,400 acres of timberland were cleared in the North Delta unit and 177,800 acres were cleared in the South Delta unit. Although the 1984 survey shows another 264,900 acres cleared in the North Delta and 181,800 acres in the South Delta, most of this acreage was cleared between 1975 and 1977 and does not reflect a current ongoing phenomenon. Much of the timberland remaining in the Mississippi Delta today is either bat-ture land or is land that does not drain well or would be of short-term significance edaphically for agriculture productivity.

Hopefully, bottomland clearing has ebbed and Louisiana's Delta units have stabilized in timberland area. Perhaps marginal agriculture land will revert back to forest in the future. Regardless, Louisiana will still lose small amounts of timberland to urban expansion, rights-of-way, and agriculture.

Louisiana parishes vary considerably in extent of forest coverage. A total of 14 parishes have less than 20 percent of their land area in timberland (fig. 3). Three of these are in the North Delta unit, the remainder along the width of the southern coastline. Conversely, 8 parishes are more than 80 percent forested. The most concentrated regions of timberland are in the western and northcentral portions of the State.

OWNERSHIP

Forest Survey reports ownership information in five major categories: National Forests, public (including timberland under public stewardship other than National Forests), forest industry, farmer, and nonindustrial private. See the Appendix for definitions of these categories. For discussion purposes and except where noted, farm owners will be grouped with the nonindustrial private owners; National Forests and other public timberland will be classed together; and forest industry timberland will stand alone.

Currently in Louisiana, 8,938,700 acres of timberland are in nonindustrial private ownership (this includes 666,800 acres that are leased to forest industry). Nonindustrial private timberland is 64 percent of all timberland in the State (fig. 4). Forest industry follows with 3,603,100 acres, 26 percent of the State's timberland. Public ownership of timberland is only 10 percent of State acreage — 1,330,700 acres. National Forest lands are almost one-half of all public lands, 620,900 acres. Note that forest survey reports National Forest acreage as a statistical estimate and not as enumeration data that is published by the USDA Forest Service. Using the statistical estimate ensures consistency and compatability of all Forest Inventory and Analysis data.

Deviation from average Statewide numbers, for the various ownerships, can be seen when looking at individual survey units. For instance, in the South Delta, 88 percent of timberland is nonindustrial private and 6 percent is forest industry. In contrast, 54 percent is private and 31 percent is forest industry in the Southwest unit (fig. 4).

Several parishes stand out in ownership patterns. Currently three parishes in Louisiana have more than 60 percent of their timberland in forest industry ownership—St. Helena in the Southeast unit, LaSalle in the Southwest unit, and East Carroll in the North Delta unit (fig. 5). Many parishes have more than 81 percent of their timberland in nonindustrial private ownership. The majority of these are in the South Delta unit and the Northwest unit (fig. 6).

Since the 1974 survey there have been some moderate changes in ownership acreage. Public ownership has increased by 308,700 acres, a 30 percent increase (table III). Most of this increase occurred in the North Delta and Northwest units (101,400 acres and 105,600 acres, respectively), but the South Delta also had an increase of 61,000 acres. Acquisition of bottomland acreage by the State is the reason for most of this increase in public ownership.

Forest industry holdings decreased 4 percent since the 1974 survey, a 158,300-acre decline. Only the Southeast and Northwest units had increases in timberland; all other units showed a decline. Forest industry holdings dropped 170,800 acres in the North and South Delta units alone. Most of this acreage went into public ownership or was diverted to agriculture or other land uses.

Statewide, nonindustrial private timberland ownership declined 8 percent, 804,400 acres. The North Delta and South Delta units accounted for 438,300 acres of this decline. The Southwest and Northwest units also had significant declines in nonindustrial private timberland holdings, 142,700 and 170,500 acres, respectively. Much of this private timberland was sold to public agencies and forest industry or was diverted to agriculture or other land uses.

FOREST TYPE

FIA assigns forest type based on dominant and codominant trees. These are also the trees most likely to be disturbed or removed from a stand either naturally or through cutting. Therefore, forest type classification is sensitive to disturbances of dominant and codominant trees on sample plots.

There are four primary reasons for shifts in forest type acreage. First, selective cutting of pine, without ensuring adequate pine regeneration, will result in a shift of pine forest types toward the hardwood types. Second, diversion of timberland acreage in a single type

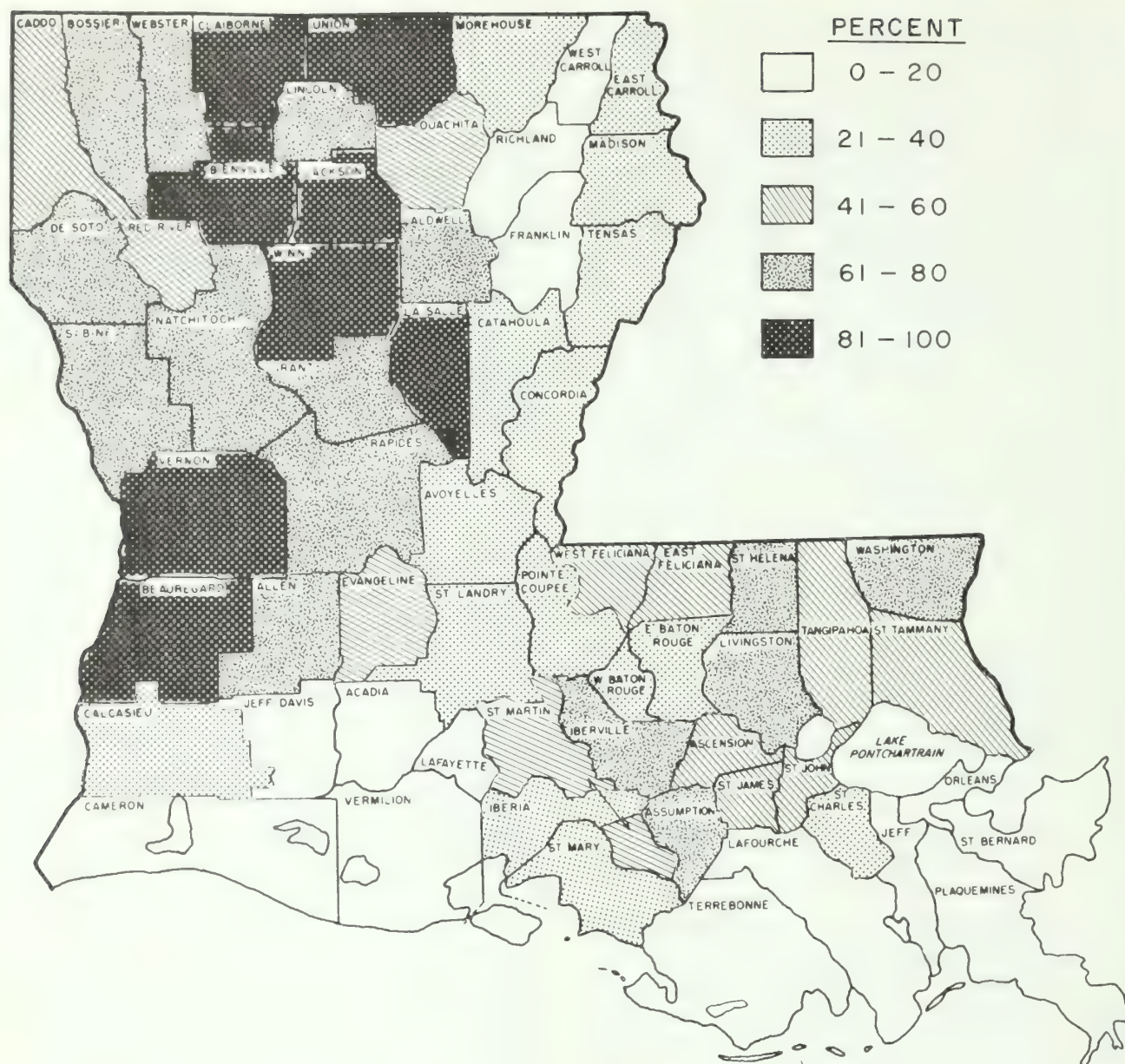


Figure 3.—Percent timberland area in Louisiana parishes, 1984.

will undoubtedly show a decline; so, loss of timberland area must be considered when portraying forest type shifts. Third, fire can shift types toward pine while fire suppression can shift types toward hardwood, especially in younger stands. Fourth, since forest typing is an artificial classification system, forest types are not totally separate and discrete entities. Rather, they merge and flow into each other, sometimes with considerable overlap, forming, in essence, a continuum. Since type categories are defined by discrete boundaries, a slight shift of species dominance across these arbitrary thresholds may give a false impression of dramatic changes in forest type acreage.

The most frequently occurring forest type in Louisiana is still oak-gum-cypress, even though the type

has declined by 579,000 acres, 12 percent, since the 1974 survey (table IV). Thirty-two percent of the State's timberland acreage (4,377,600 acres) is in this type, it being most prevalent in the North Delta, South Delta, and Southeast units (fig. 7). Most of the oak-gum-cypress type decline occurred in the North Delta unit. There, 307,200 acres were lost primarily due to conversion to agricultural use. This conversion trend has slowed in the lower Mississippi River Valley (Rudis and Birdsey 1986).

The loblolly-shortleaf forest type occurs on 29 percent of Louisiana's timberland and is most common in the Northwest and Southwest units where 1,789,900 and 1,530,900 acres are occupied, respectively (table IV). Eighty-two percent of the State's loblolly-shortleaf

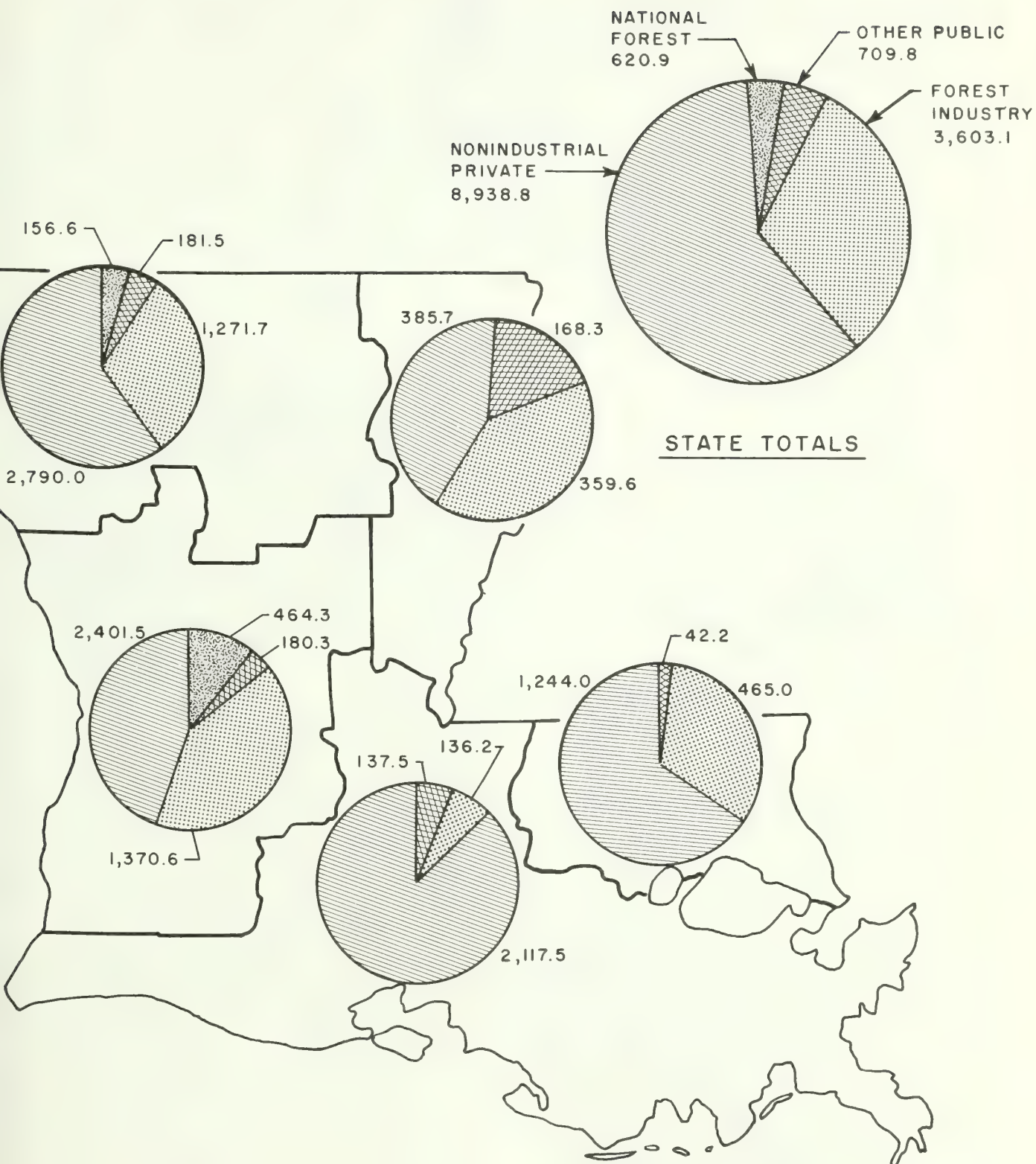


Figure 4.—Proportion of timberland in thousand acres by ownership, Louisiana, 1984.

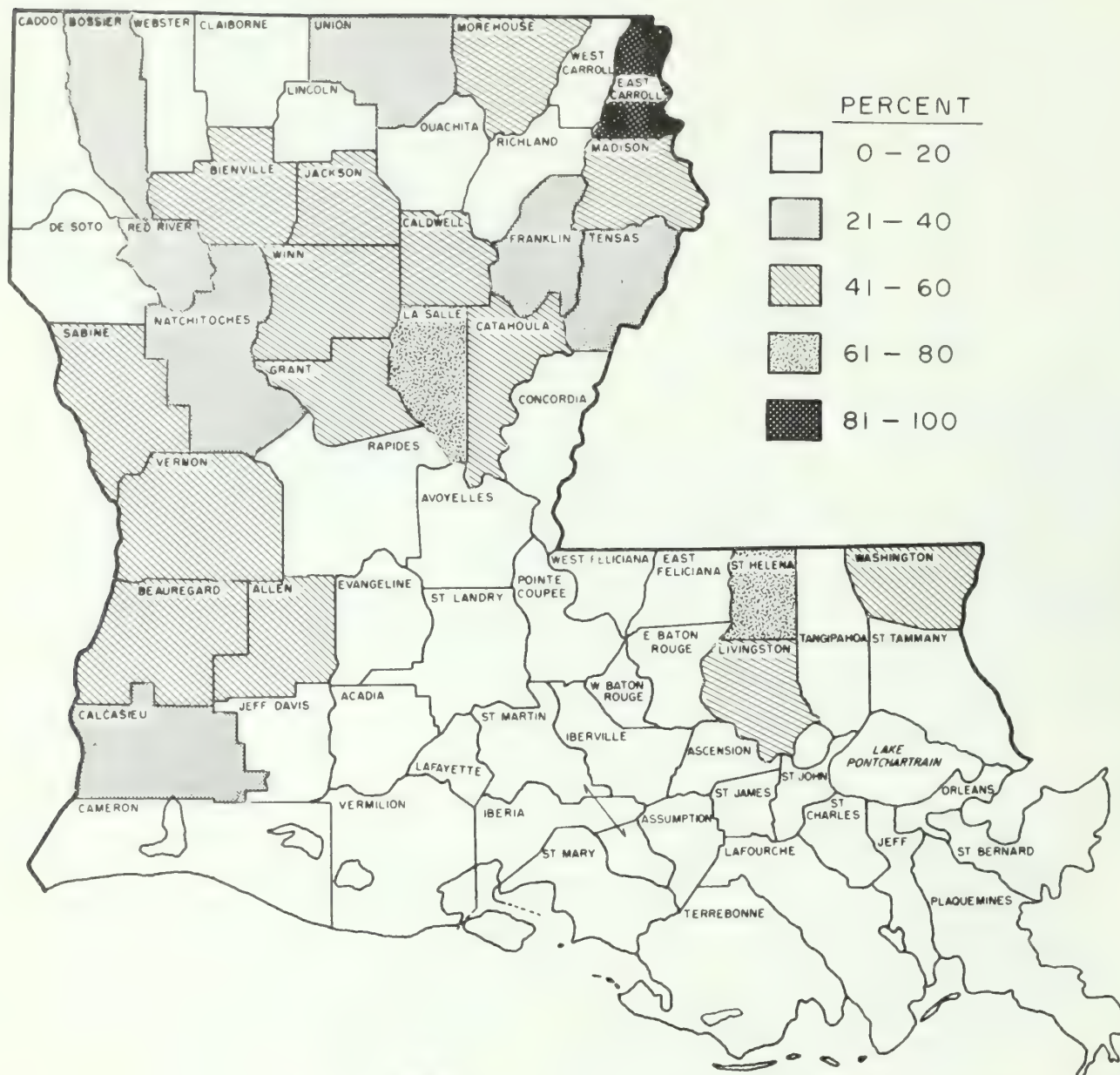


Figure 5.—Percent timberland held by forest industries, Louisiana, 1984.

type is in these two units. Currently, 4,033,200 acres of this type exist in the State and since the 1974 survey only a 1 percent decline in acreage has occurred.

Currently, there are 933,200 acres of the longleaf-slash forest type, an 89,400-acre drop since 1974. The Southwest unit has 84 percent of the State's longleaf-slash type followed by the Southeast unit with 14 percent. As older longleaf stands are cut, many are being replaced with loblolly stands, especially on sites which are marginal (heavier soils) for longleaf pine and slash pine. Between 1974 and 1984, approximately 150,000 acres of the longleaf-slash forest type were clearcut; approximately 30,000 of these acres were converted to loblolly pine.

A decline of the oak-pine forest type is linked to an increase in the oak-hickory forest type mostly because of selective cutting of pine on private land without subsequent regeneration practices to replace pine. This results in a shift to the oak-hickory type acreage. Statewide, the oak-pine type decreased 294,300 acres and the oak-hickory type increased 445,200 acres. The oak-pine decrease occurred in the Southwest and Northwest units. Here, 319,400 acres dropped out of the type while the North Delta, South Delta, and Southeast units increased in oak-pine acreage slightly—37,200 acres.

Across Louisiana, each unit except the South Delta increased its oak-hickory forest type acreage. The

Table III.—Area of timberland by ownership, forest survey units, and percent change, Louisiana, 1974-1984¹

Forest survey units	All owners	Public	Change	Forest industry ²	Change	Nonindustrial private	Change
----- Thousand acres -----							
North Delta	913.5	168.3	+152	359.6	-20	385.7	-42
South Delta	2,391.3	137.5	+80	136.2	-38	2,117.5	-7
Southwest	4,416.8	644.6	+7	1,370.6	-1	2,401.6	-6
Southeast	1,751.2	42.2	+1	465.0	+4	1,244.0	-4
Northwest	4,399.9	338.1	+45	1,271.7	+1	2,790.0	-6
All units	13,872.6	1,330.7	+30	3,603.1	-4	8,938.8	-8

¹ Rows and columns may not sum due to rounding.

² Not including 666,800 acres of private lands leased to forest industry.

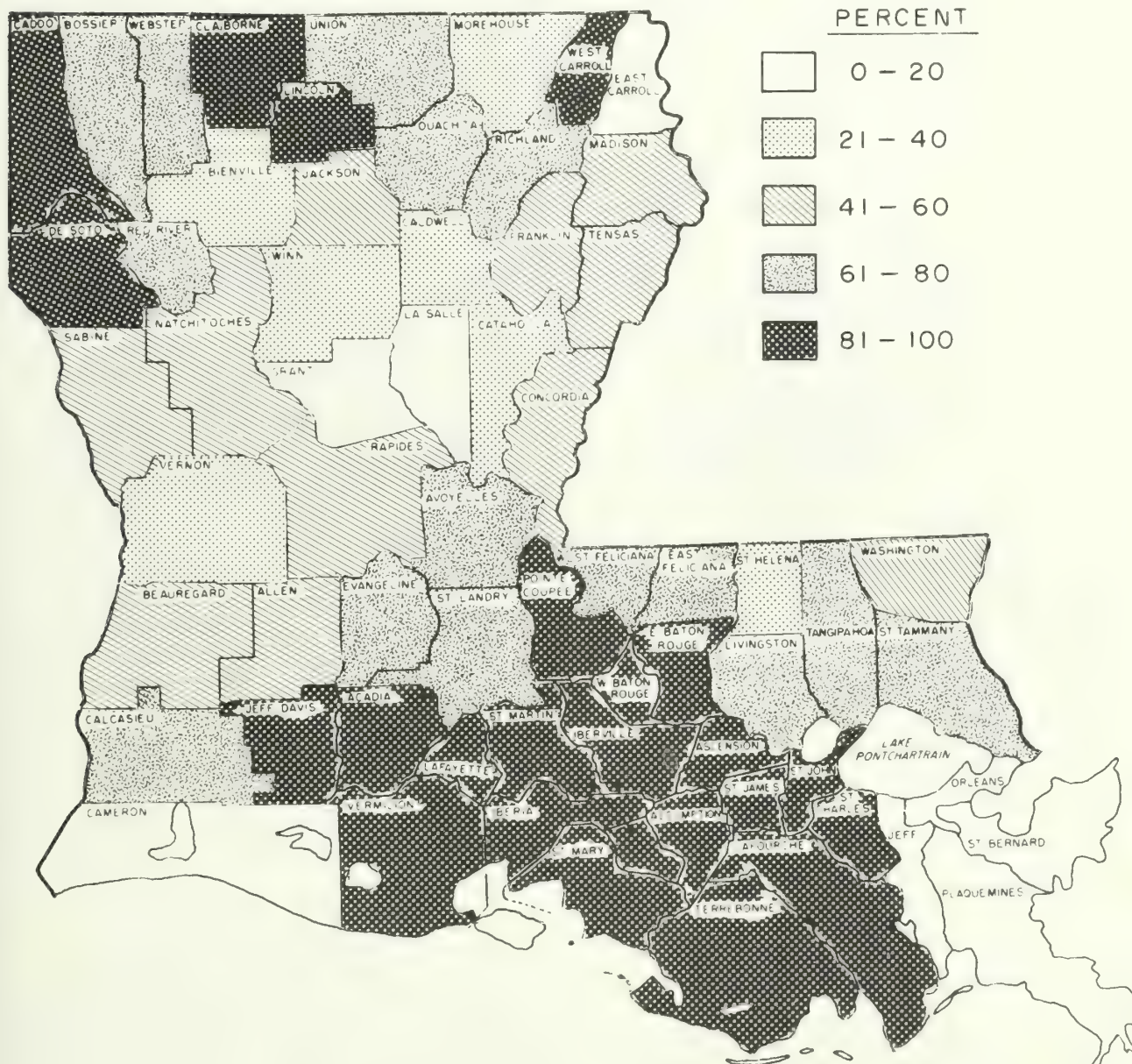


Figure 6.—Percent timberland held by nonindustrial private landowners, Louisiana, 1984.

Table IV Area of timberland by forest types, percent change, and forest survey units, Louisiana, 1974 1984¹

Forest survey units	All types		Longleaf slash		Loblolly-shortleaf		Oak pine		Oak-hickory		Oak-gum-cypress		Elm-ash-cottonwood		Nontyped ²	
	Thousand acres	Percent	Thousand acres	Percent	Thousand acres	Percent	Thousand acres	Percent	Thousand acres	Percent	Thousand acres	Percent	Thousand acres	Percent	Thousand acres	Percent
North Delta	913.5	6.1	98.1	+34	81.1	+13	55.5	+39	561.0	35	103.6	13	8.1			
South Delta	2,391.3	0.0	55.9	+28	11.5	+83	82.7	(³)	1,989.8	-5	243.4	30	8.0			
Southwest	4,416.8	779.3	+2	4	677.6	18	678.6	-26	716.9	10	33.5	+20	0.0			
Southeast	1,751.2	131.4	-41	-2	259.3	+4	357.6	+21	438.9	3	0.0	100	5.5			
Northwest	4,399.9	16.3	-39	-8	883.9	17	996.3	+30	670.9	-10	31.9	+14	10.8			
All units	13,872.6	933.2	-9	-1	1,913.3	-13	2,170.7	+26	4,377.6	-12	412.4	-24	32.2			

¹ Rows and columns may not sum due to rounding.² No live trees, saplings, or seedlings.³ Less than 1 percent change

South Delta unit showed less than a 1 percent change since 1974. Most of the 445,200-acre oak-hickory increase was in the Northwest and Southwest units, 228,500 and 140,500 acres, respectively. These two units account for 83 percent of the oak-hickory type increase in the State.

Species dominance in particular forest types is illustrated by forest survey units in figures 8a-8e. In the longleaf-slash forest type, slash pine clearly dominates the type in the Southwest, Southeast, and Northwest units with more than double the growing-stock volume of longleaf pine. Longleaf pine ranks second and, together, these two species account for 91, 92, and 96 percent of longleaf-slash forest type growing-stock volume, respectively, in these three units.

In the loblolly-shortleaf forest type, loblolly pine accounts for 70 percent or more of the volume in every unit. Shortleaf is a distant second followed closely by sweetgum. Less than 10 percent of the volume in the loblolly-shortleaf type is made up of species other than loblolly, shortleaf, and sweetgum.

Loblolly pine still accounts for a major portion of the volume in the oak-pine forest type but is not nearly as dominant as in the loblolly-shortleaf type. For the oak-pine forest type in the Southwest, Southeast, and Northwest units, loblolly accounts for 53, 37, and 42 percent of the growing-stock volume, respectively. Second ranking dominants are composed of several species including sweetgum, shortleaf pine, slash pine, southern red oak, and numerous others.

The oak-hickory forest type is not dominated strongly by a particular species. In the Southwest, Southeast, and Northwest units loblolly pine and sweetgum together account for 36, 33, and 32 percent, respectively, of the growing-stock volume. The North Delta and South Delta units are dominated by white oak, American beech, sweetgum, and water oak. However, in these units the dominance is not as striking and other species rank close behind in importance.

The bottomland types are dominated by sweetgum except in the South Delta and Southeast units. Here, baldcypress and water tupelo predominate, accounting for 52 and 30 percent of the growing-stock volume, respectively. The other three units are dominated by sweetgum, followed by willow, water oak, loblolly pine, and blackgum. The diversity of the bottomland forest type becomes evident as it takes eight species or more to account for at least 70 percent of the growing-stock volume.

TIMBER VOLUME

Presently in Louisiana 22,023 million cubic feet of timber exists on timberland (in trees ≥ 5.0 inches diameter at breast height [d.b.h.]). Of this, 18,992 million cubic feet are in growing-stock trees. This

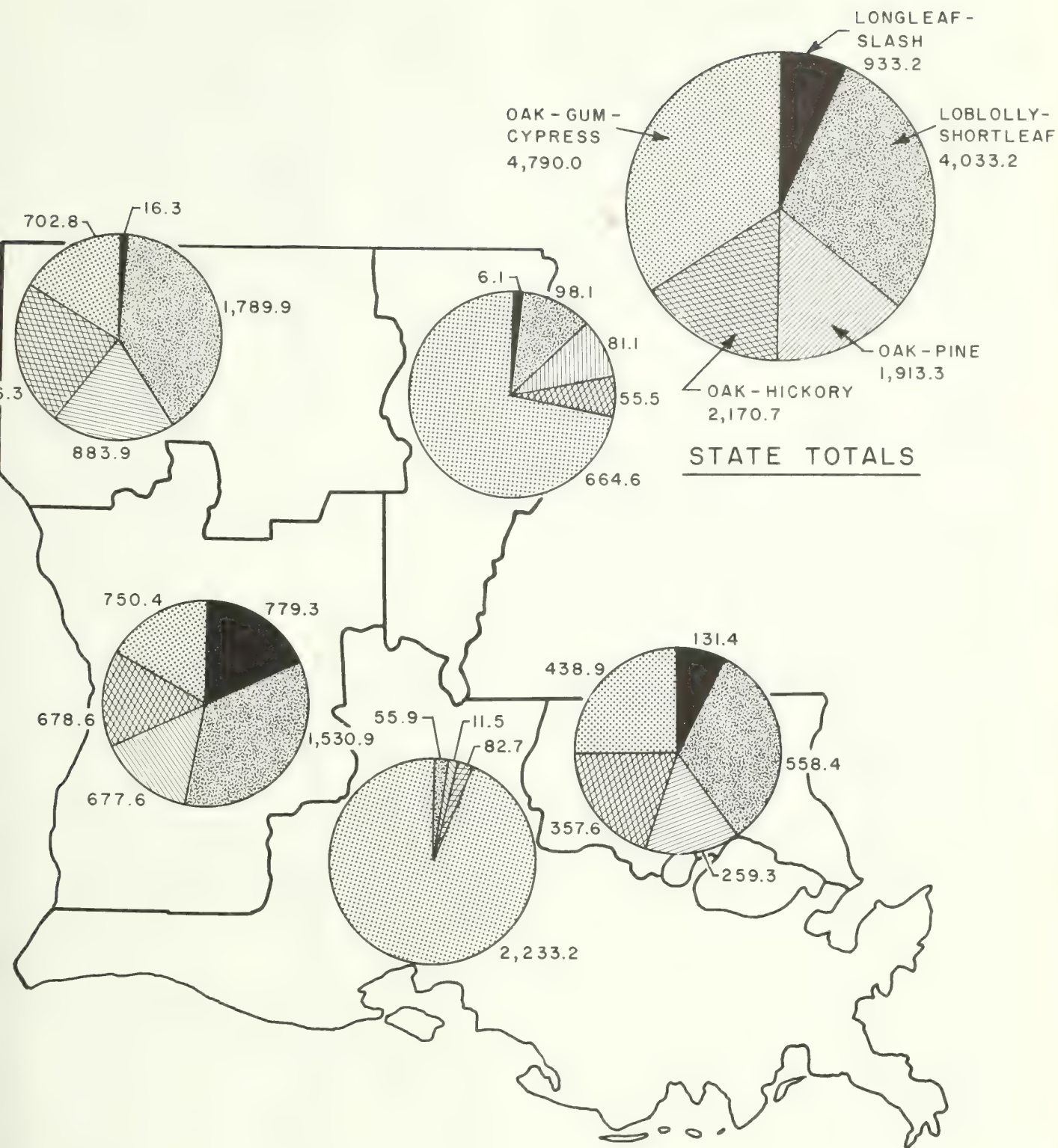


Figure 7.—Proportion of timberland in thousand acres by forest type, Louisiana, 1984. Elm-ash-cottonwood forest type is included in the oak-gum-cypress forest type.

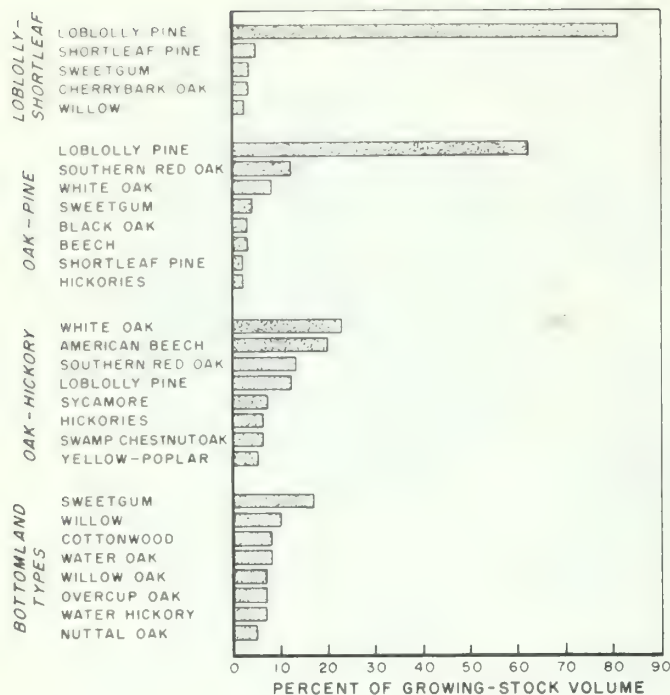


Figure 8a.—Relative species importance by forest type, North Delta unit, Louisiana, 1984. The importance value is volume.

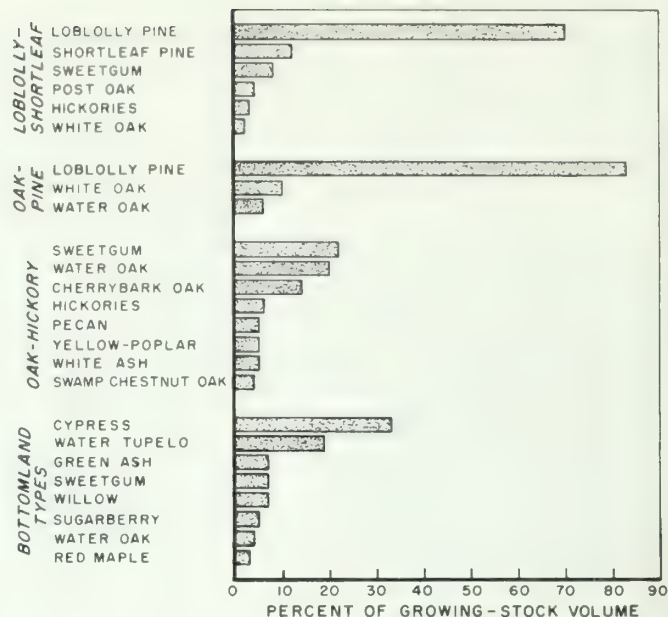


Figure 8b.—Relative species importance by forest type, South Delta unit, Louisiana, 1984. The importance value is volume.

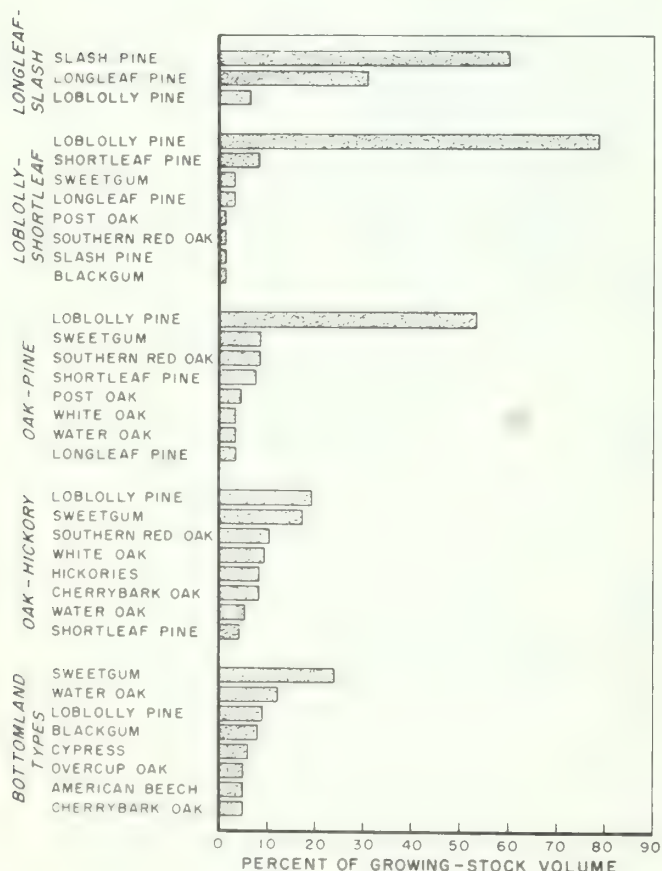


Figure 8c.—Relative species importance by forest type, Southwest unit, Louisiana, 1984. The importance value is volume.

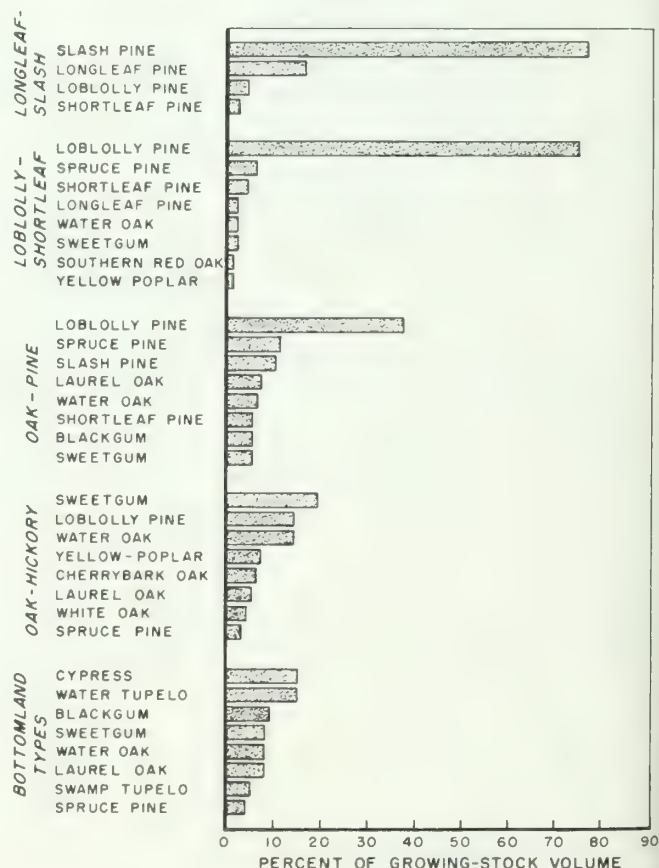


Figure 8d.—Relative species importance by forest type, Southeast unit, Louisiana, 1984. The importance value is volume.

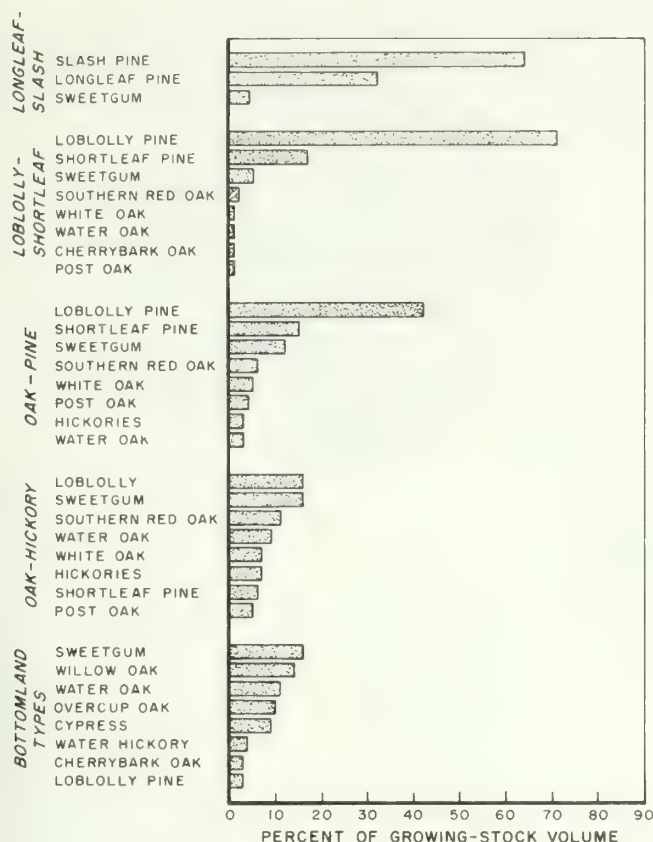


Figure 8e.—Relative species importance by forest type, Northwest unit, Louisiana, 1984. The importance value is volume.

represents a 15 percent increase in gross volume and a 14 percent increase in growing-stock volume since the 1974 survey. In total growing-stock volume there are 4,145 million cubic feet in poletimber trees and 14,847 million cubic feet in sawtimber timber trees, a 10 percent decrease and 23 percent increase, respectively (fig. 9).

Most of the increase in growing-stock volume occurred on nonindustrial private timberland—1,743 million cubic feet (76 percent of the increase). Volume on public timberland accounted for the remaining 24 percent of the increase while forest industry growing-stock volume did not change. Currently, 10 percent of growing-stock volume is on public timberland, 23 percent is on forest industry timberland, and 66 percent is on nonindustrial private timberland. These are only slight shifts in distribution of growing-stock volume since 1974, when, 8, 27, and 65 percent, of growing-stock volume was on public, forest industry, and nonindustrial private timberland, respectively.

Total sawtimber volume increased by 9,920 million board feet since 1974. Most of this increase, 7,900 million board feet, was on nonindustrial private timberland, but public timberland also had a substan-

tial increase—2,218 million board feet. Sawtimber volume on forest industry timberland decreased very slightly. Currently, 12 percent of sawtimber volume is on public timberland, 24 percent is on forest industry timberland, and 64 percent is on nonindustrial private timberland. This distribution of sawtimber volume is a shift from the respective volume distributions of 10, 28, and 62 percent reported in 1974.

Sound wood in cull trees totals 3,031 million cubic feet. This is a 23 percent increase since the 1974 survey. Most of the cull increase (74 percent) occurred in hardwood volume. Softwood cull has increased by 26 percent since the 1974 survey. The probable causes for these increases are trees reaching older ages along with increases in stand density.

Softwood Growing-Stock Volume

Current softwood growing-stock inventory in Louisiana is 10,552 million cubic feet. This is 17 percent over the 1974 volume with every survey unit increasing its softwood inventory (table V). The largest increase was in the Northwest unit—503 million cubic feet, followed by the Southwest unit with 475 million cubic feet. These two units alone account for 65 percent of the increase in softwood growing-stock volume for the State.

Louisiana is a softwood State with 56 percent of its growing-stock volume in softwoods (fig. 10). The proportion of softwood volume is 48 percent (baldcypress excluded). Softwood growing stock is predominant in the Southwest, Southeast, and Northwest survey units with 69, 57, and 60 percent, respectively, of those units being in southern pine growing stock. Baldcypress is significant primarily in the South Delta unit where it accounts for 31 percent of the total growing-stock volume (fig. 10).

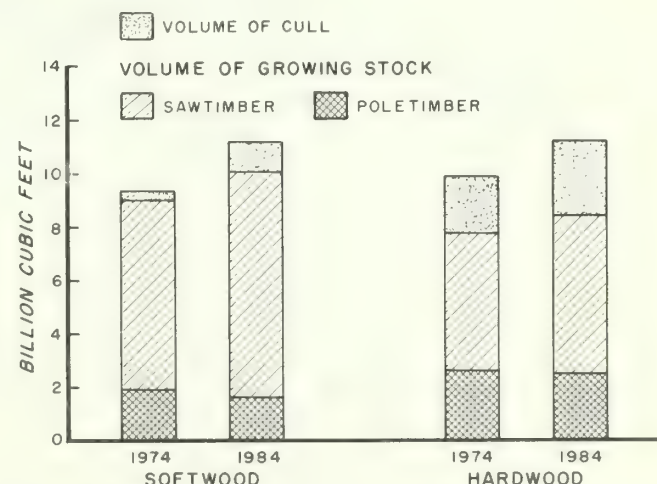


Figure 9.—Volume of timber by species group and class of timber, Louisiana, 1984.

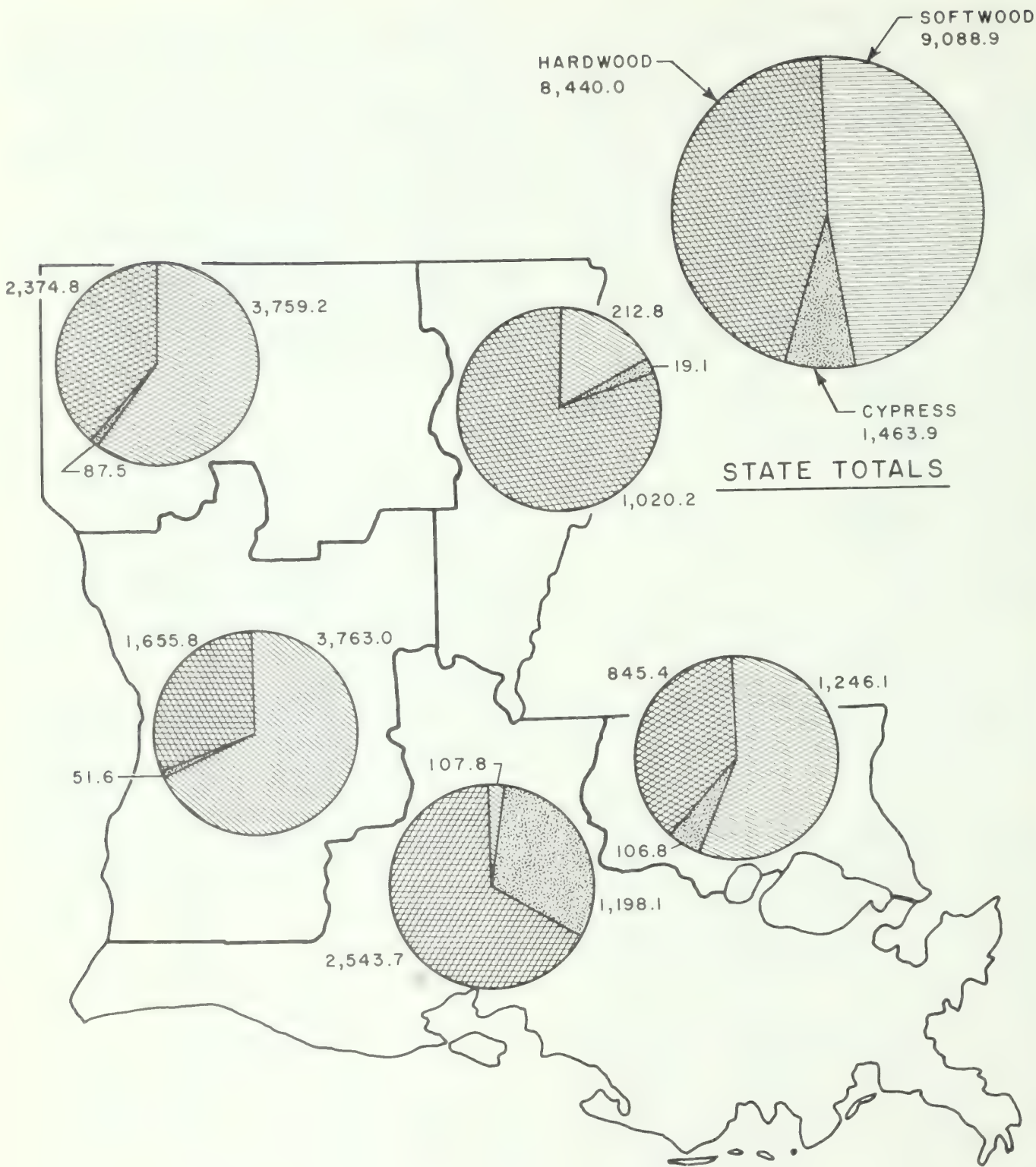


Figure 10.—Proportion of growing-stock volume in million cubic feet by species group (and cypress), Louisiana, 1984.

Table V.—Percent change in growing-stock volume by forest survey units, Louisiana, 1974-1984¹

Forest survey units	Softwood		Hardwood	
	Volume	Change	Volume	Change
	Million cubic feet	Percent	Million cubic feet	Percent
North Delta	231.9	+34	1,020.2	-9
South Delta	1,305.9	+31	2,543.7	+11
Southwest	3,814.6	+14	1,655.8	-1
Southeast	1,352.9	+14	845.4	+15
Northwest	3,846.7	+15	2,374.8	+27
All units	10,552.0	+17	8,440.0	+10

¹ Rows and columns may not sum due to rounding.

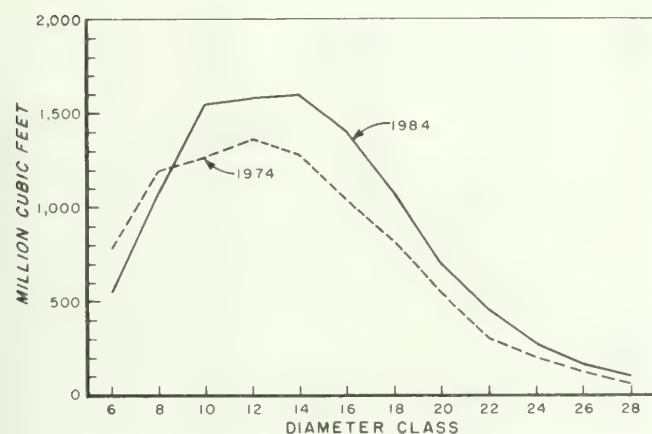


Figure 11.—Softwood growing-stock volume by diameter class, Louisiana, 1974 and 1984.

Except for the 6-inch and 8-inch diameter classes, softwood growing-stock volume has increased across the range of diameter classes since the 1974 survey (fig.11). The largest increases in volume occurred in the 10-inch through 16-inch classes. Of concern are the reduced increases in volume in the 6- and 8-inch classes, where present growing stock is below 1974 inventory levels.

Table VI gives an indication of overall tree sizes by species and species groups. The board-foot to cubic-foot ratio gives a general index for tree sizes, the lower ratio indicating the prevalence of more small-sized trees (poletimber-size trees versus sawtimber-size trees).

All the softwood species except longleaf pine and baldcypress have increased in average size since the 1974 survey; that is, more trees are moving into saw-log sizes and trees already saw-log size are slightly larger. It appears that baldcypress, although increasing in growing-stock volume, is losing many larger trees to cutting.

In Louisiana, 6,600 million cubic feet (63 percent) of softwood volume is in loblolly pine (fig.12). It is, by far, the dominant southern pine in the State. Loblolly is also the only southern pine to have a noteworthy increase in inventory volume since the 1974 survey, 1,080 million cubic feet (a 20 percent increase). The slash pine inventory rose 200 million cubic feet since the 1974 survey. Shortleaf pine and longleaf pine showed slight decreases in their inventories.

Currently in Louisiana, 10 percent of softwood growing-stock volume is on public timberland, 26 percent is on forest industry timberland, and 64 percent is on nonindustrial private timberland. Most of the increase in softwood volume (80 percent) was on nonindustrial private timberland.

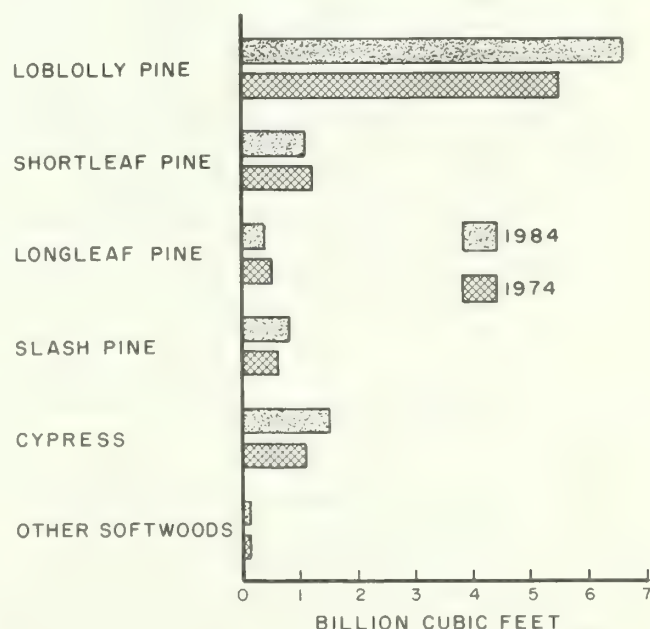


Figure 12.—Softwood growing-stock volume by species, Louisiana, 1974 and 1984.

Table VI.—*Distribution of net volume among commercial species and board foot to cubic foot ratios, Louisiana 1974 and 1984¹*

Species	Volume				Board foot to cubic foot ratio	
	Million cubic feet		Million board feet ⁴		1974	1984
	1974	1984	1974	1984		
Softwood:						
Longleaf pine	484.7	438.2	2,138.8	1,666.8	4.41	3.80
Slash pine	589.8	790.5	1,395.3	2,114.1	2.36	2.67
Shortleaf pine	1,217.4	1,141.3	4,872.1	4,701.1	4.00	4.12
Loblolly pine	5,507.5	6,587.4	23,429.0	31,113.0	4.25	4.72
Spruce pine	92.1	126.8	413.9	631.0	4.49	4.98
Cypress	1,147.5	1,463.0	4,741.3	5,201.8	4.13	3.56
Red cedar	1.0	4.7	2.3	17.7	2.30	3.77
Total	9,040.0	10,551.9	36,992.7	45,445.5	4.09	4.31
Hardwood:						
Select white oaks ²	329.4	367.5	1,147.2	1,090.2	3.48	2.97
Select red oaks ³	189.6	297.7	681.3	1,039.1	3.59	3.49
Other white oaks	510.7	476.2	1,707.3	1,621.4	3.34	3.40
Other red oaks	1,536.8	1,869.2	5,018.0	6,254.1	3.27	3.34
Sweet pecan	344.1	77.2	1,268.1	275.6	3.69	3.57
Hickories	225.3	485.4	755.1	1,566.2	3.35	3.23
Hard maple	3.4	3.2	6.9	13.9	2.03	4.34
Soft maple	153.8	182.4	234.3	280.9	1.52	1.54
Beech	143.3	127.2	652.7	542.6	4.55	4.27
Sweetgum	1,398.7	1,578.1	4,025.3	4,226.3	2.88	2.68
Tupelo and blackgum	1,176.7	1,146.6	3,123.2	2,999.2	2.65	2.62
Ash	405.5	432.7	1,096.4	1,208.1	2.70	2.79
Sycamore	51.4	92.8	152.1	279.2	2.96	3.01
Cottonwood	106.3	170.1	454.7	610.4	4.28	3.59
Basswood	6.6	5.1	11.4	13.0	1.73	2.55
Yellow-poplar	27.9	52.6	99.2	202.0	3.56	3.84
Magnolia	72.6	21.9	185.7	68.9	2.56	3.15
Willow	329.6	361.9	1,357.2	1,290.9	4.12	3.57
Black cherry	11.2	20.3	24.8	43.3	2.21	2.13
American elm	129.6	130.8	406.3	377.3	3.14	2.88
Other elms	144.4	127.6	415.1	292.9	2.87	2.30
Hackberry	229.1	236.2	693.8	649.3	3.03	2.75
Other commercial hardwoods	131.5	177.3	306.6	345.1	2.33	1.95
Total	7,657.5	8,440.0	23,822.7	25,289.9	3.11	3.00
All species	16,697.4	18,991.9	60,815.3	70,735.4	3.64	3.72

¹ Rows and columns may not sum due to rounding.

² Includes white, swamp chestnut, swamp white, and chinkapin oak (Durand and bur oak are select white oaks but did not occur in the Louisiana sample).

³ Includes cherrybark and Shumard oak (northern red oak is a select red oak but did not occur in the Louisiana sample).

⁴ International ¼-inch rule.

Softwood Sawtimber Volume

Softwood sawtimber volume is 45,445 million board feet, a 23 percent increase over the 1974 survey (table VII). Together, the Southwest and Northwest units have 75 percent of the State's softwood sawtimber volume.

The largest reported increases in sawtimber inventory were in the Northwest and Southwest units, 3,685 and 3,105 million board feet, respectively. The South

Delta unit had a 693 million board feet increase in softwood sawtimber volume, most of which was in baldcypress.

Fifty-seven percent of the State's sawtimber volume is in southern pines, 7 percent in baldcypress (fig. 13). Only the South Delta unit is noteworthy in baldcypress sawtimber volume. Southern pines comprise two-thirds or more of the State's sawtimber volume in the Southwest, Southeast, and Northwest units. Even in the North Delta unit, southern pines make up 20 percent of that unit's sawtimber volume,

Table VII.—Percent change in sawtimber volume by forest survey units, Louisiana, 1974-1984¹

Forest survey units	Softwood		Hardwood	
	Volume	Change	Volume	Change
	<i>Million board feet ²</i>	<i>Percent</i>	<i>Million board feet ²</i>	<i>Percent</i>
North Delta	1,067.9	+40	3,819.2	-5
South Delta	4,808.9	+17	7,827.5	+11
Southwest	16,482.6	+23	4,743.3	-7
Southeast	5,645.6	+13	2,381.9	+13
Northwest	17,440.4	+27	6,517.9	+18
All Units	45,445.4	+23	25,289.8	+6

¹ Rows and columns may not sum due to rounding.² International ¼-inch rule.

primarily on the Macon Ridge, an elevated geologic region in the western parishes.

Figures 14a through 14e illustrate the relative distribution of softwood sawtimber volume, in areal extent, by varying scales of volume per acre. Timberland area is not broken down by forest type, physiographic class, etc., in these figures but is the total area versus the total volume for the respective unit. Two things stand out when studying these figures; (1) there is much timberland with very little softwood sawtimber volume and; (2) there is little timberland with adequate amount of softwood sawtimber volume per acre.

In every unit, except the South Delta, 50 percent or more of softwood sawtimber is on timberland that has 9,000 or more board feet per acre. In the South Delta unit, 41 percent of the softwood sawtimber (mostly baldcypress) is on timberland with 9,000 or more board feet per acre. However, the acreage in all survey units of timberland with 9,000 or more board feet per acre is minimal. The Southwest and Northwest units have the most timberland acreage in this category, 13 and 16 percent respectively.

Countering this are large amounts of acreage with less than 1,000 board feet per acre. The North Delta unit has a large amount of such acreage because of the small amount of softwood sawtimber in the unit. All of the other units have at least 40 percent of their timberland with only 1,000 or less board feet per acre. The South Delta unit has the highest amount (63 percent) of timberland in the category of 1,000 or less board feet per acre. Softwoods in this unit are primarily baldcypress, and the restrictive conditions necessary for baldcypress reproduction may contribute to this large amount of low sawtimber volume per acre. In units where southern pines predominate in sawtimber volume, (the Southwest, Southeast, and Northwest), 43 percent of the timberland contains only 2 percent of the State's softwood volume.

Hardwood Growing-Stock Volume

Hardwood growing-stock volume has increased from 7,657 million cubic feet to 8,440 million cubic feet since the 1974 survey, a 10 percent rise (table V). However, not every survey unit had an increase. Most notably, the North Delta unit fell 100 million cubic feet to the current 1,020 million cubic feet, a 9 percent change. The most significant change in volume occurred in the Northwest unit. There, hardwood growing-stock volume increased by 502 million cubic feet, a 27 percent rise.

Even with the substantial volume increase in the Northwest unit, the South Delta unit still has most of the State's hardwood growing-stock volume. Together, the South Delta and Northwest units hold 58 percent of the State's hardwood growing-stock volume.

Most of the hardwood volume is in other red oaks, sweetgum, and blackgum-tupelo species. These groups account for 54 percent (4,594 million cubic feet) of Louisiana's hardwood volume (fig. 15). White oak volumes have fallen slightly since the 1974 survey. Although select red oak volumes increased slightly, the select red oak and select white oak classes account for only 8 percent of the hardwood volume.

Since the 1974 survey, hardwood growing-stock volumes increased in every diameter class except the 6-, 8-, and 10-inch classes (fig. 16). The largest increase was in the 12-inch diameter class. The significant volume decrease in the 6-inch class suggests that future hardwood inventories will stabilize or decline slightly.

Currently in the State, 10 percent of hardwood growing-stock volume is on public timberland, 20 percent on forest industry, and 70 percent on nonindustrial private timberland. Volume increases were on nonindustrial private and public timberland with forest industry showing a decrease.

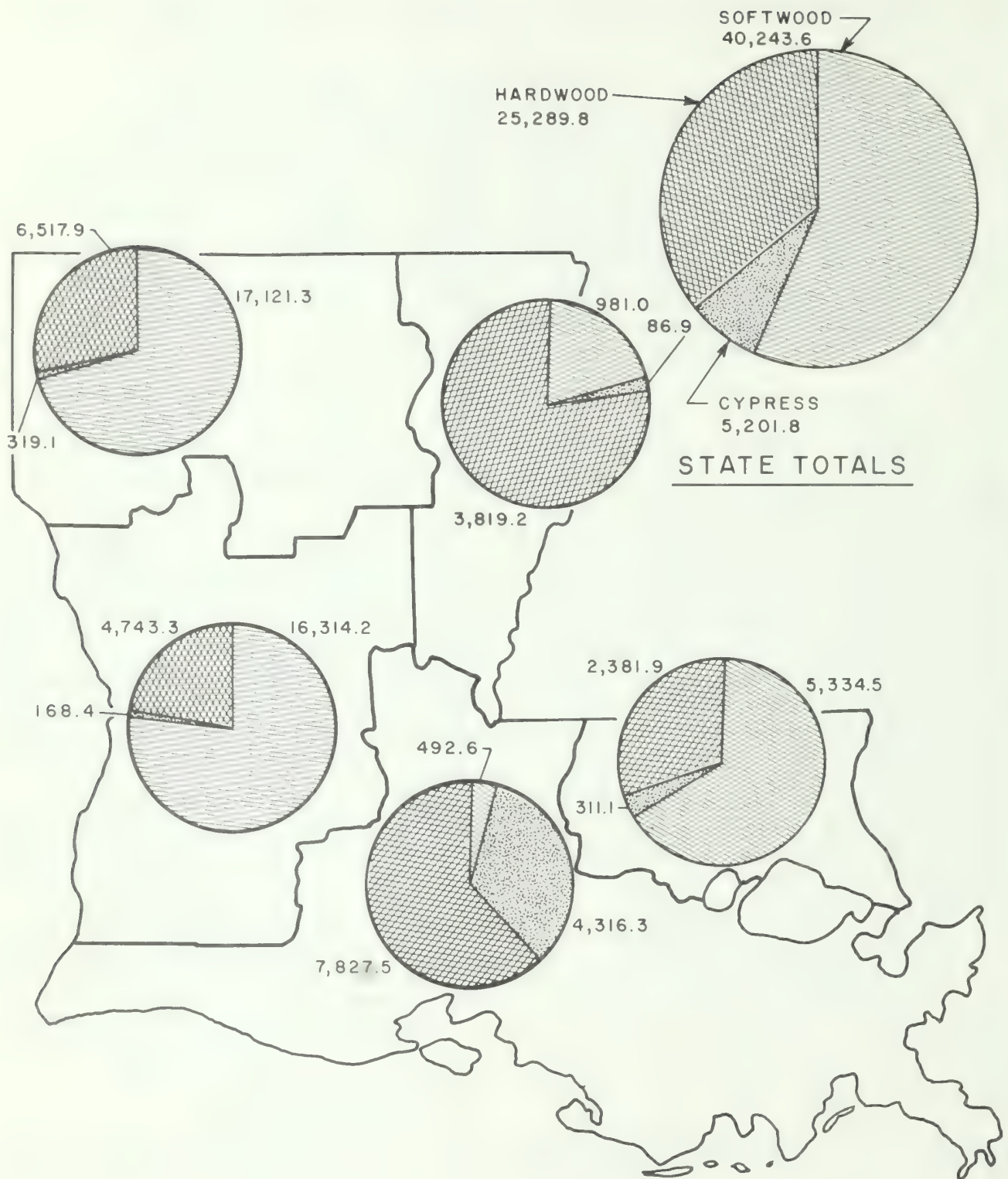


Figure 13.—Proportion of sawtimber volume in million board feet by species group (and cypress), Louisiana, 1984.

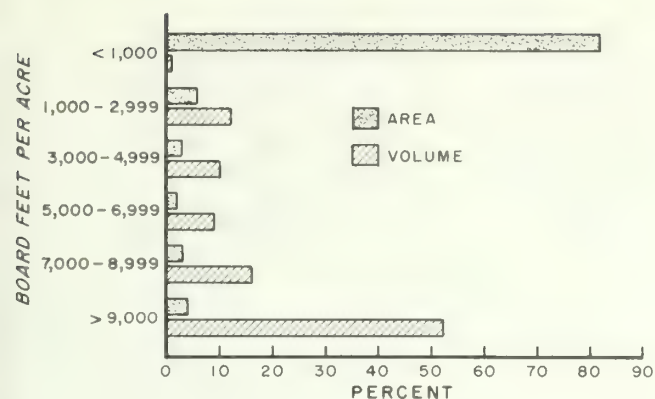


Figure 14a.—Area and softwood sawtimber volume comparison by volume classes, North Delta unit, Louisiana, 1984.

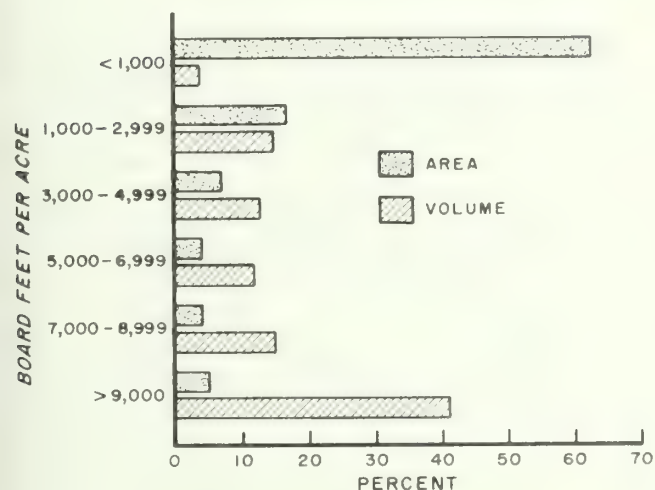


Figure 14b.—Area and softwood sawtimber volume comparison by volume classes, South Delta unit, Louisiana, 1984.

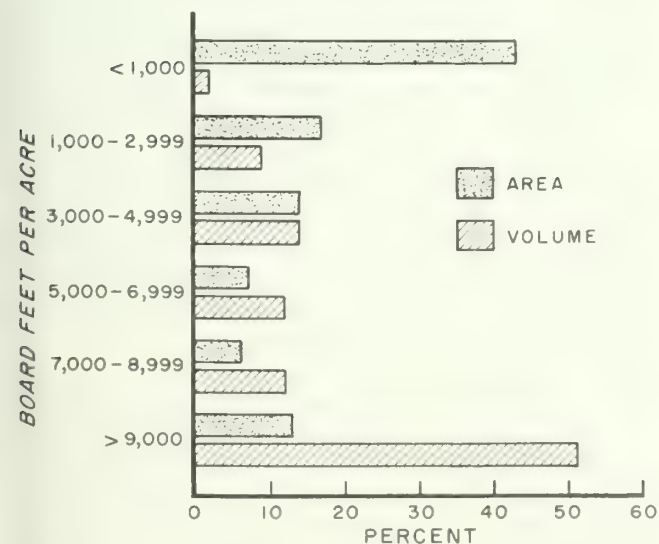


Figure 14c.—Area and softwood sawtimber volume comparison by volume classes, Southwest unit, Louisiana, 1984.

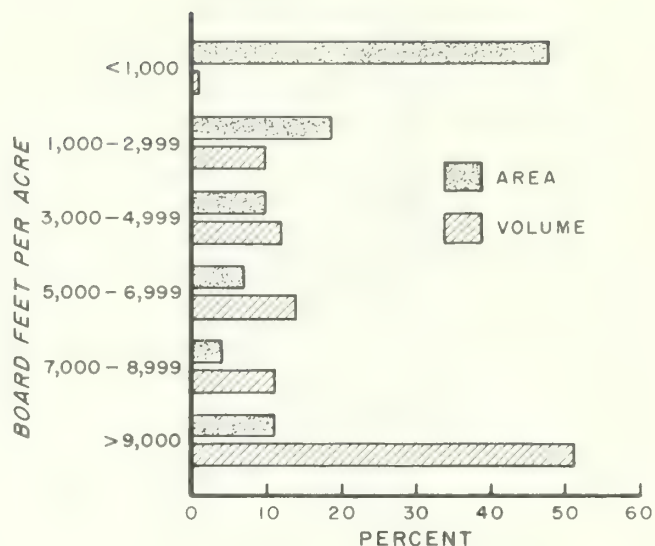


Figure 14d.—Area and softwood sawtimber volume comparison by volume classes, Southeast unit, Louisiana, 1984.

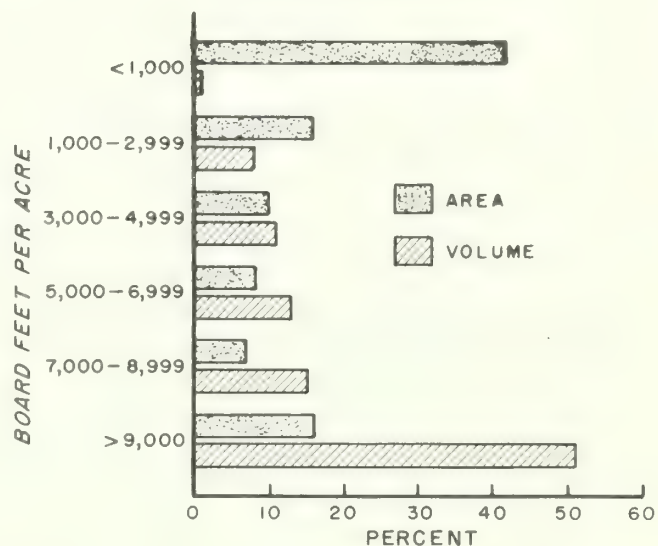


Figure 14e.—Area and softwood sawtimber volume comparison by volume classes, Northwest unit, Louisiana, 1984.

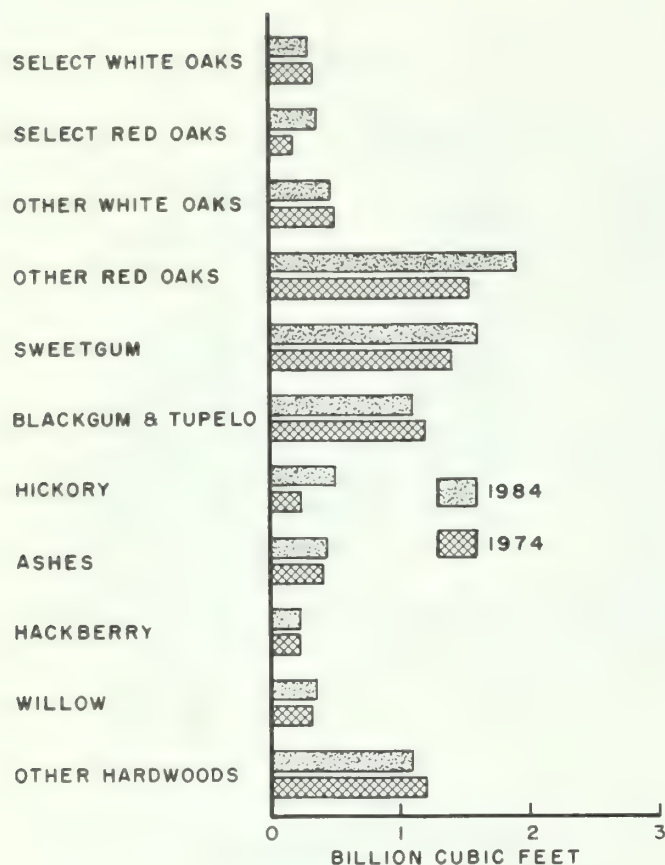


Figure 15.—Hardwood growing-stock volume by species, Louisiana, 1974 and 1984.

Hardwood Sawtimber Volume

Louisiana's hardwood sawtimber volume is up 6 percent since the 1974 survey, increasing from 23,823 million board feet to 25,290 million board feet. Most of the sawtimber volume is in the South Delta, Southwest, and Northwest units (table VII). Approximately 75 percent of the State's hardwood sawtimber volume is in these three units.

The largest increase in volume, amounting to 18 percent, occurred in the Northwest unit. There were inventory decreases in the North Delta and Southwest units. Losses can be attributed mostly to the timberland-base decline in the North Delta and to selective exclusion of hardwood management in the Southwest unit. Figures 17a-17e illustrate the relative distribution of hardwood sawtimber volume by volume-per-acre classes. The units with large areas of upland hardwoods—Southwest, Southeast, and Northwest—have high amounts of acreage with very low sawtimber volumes. In contrast to the softwood sawtimber volume these units have little acreage with 9,000 or more board feet per acre.

Adequate amounts of hardwood sawtimber volume are rare in the Southwest unit. Here, 88 percent of timberland has only 34 percent of the hardwood

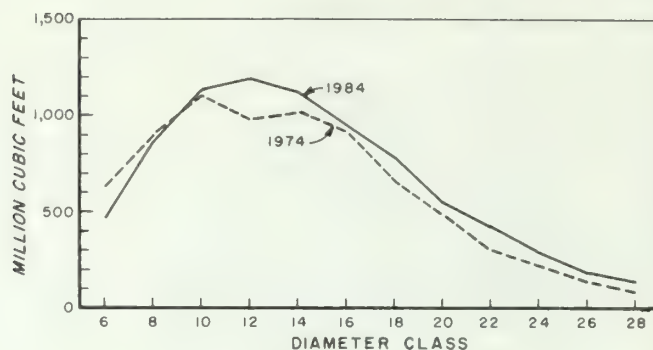


Figure 16.—Hardwood growing-stock volume by diameter class, Louisiana, 1974 and 1984.

sawtimber volume. And, only 6 percent of timberland has 5,000 or more board feet per acre. Forty-four percent of the unit's sawtimber volume is on these lands.

Similarly, in the Southeast unit, 83 percent of the timberland has 35 percent of the hardwood sawtimber volume where concentrations are less than 3,000 board feet per acre. On timberland with higher concentrations of sawtimber (5,000 board feet or more per acre), 10 percent of the unit's timberland holds 41 percent of the volume. The Southeast unit has relatively few stands of hardwood sawtimber with 9,000 or more board feet per acre.

The Northwest unit also has large amounts of timberland with less than 3,000 board feet per acre. Here, 83 percent of timberland holds 32 percent of hardwood sawtimber. Also, 23 percent of the unit's hardwood sawtimber grows on only three percent of its timberland that contains 9,000 or more board feet per acre.

The North Delta unit, primarily bottomland hardwoods, has almost 50 percent of its volume on timberland with 9,000 or more board feet per acre. Only 14 percent of the unit's timberland is in this category. Conversely, 56 percent of the unit's timberland has 13 percent of the sawtimber volume.

In the Southeast unit, 83 percent of the timberland has 35 percent of the hardwood sawtimber volume where concentrations are less than 3,000 board feet per acre. On timberland with higher concentrations of sawtimber (5,000 board feet or more), 10 percent of the unit's timberland holds 41 percent of the volume. The Southeast unit has relatively few stands with 9,000 or more board feet per acre, and those stands cover less than 3 percent of timberland area.

The hardwood inventory, overall, appears to be comprised of slightly smaller-sized trees. Since the 1974 survey the select white oak and red oak group board-foot to cubic-foot ratios declined as did the hickories (table VI). However, other white and red oaks, and the ashes showed a slight increase in their ratios. Overall, the State's board-foot to cubic-foot ratios indicate that increased hardwood volume is on an increased number of smaller sized trees.

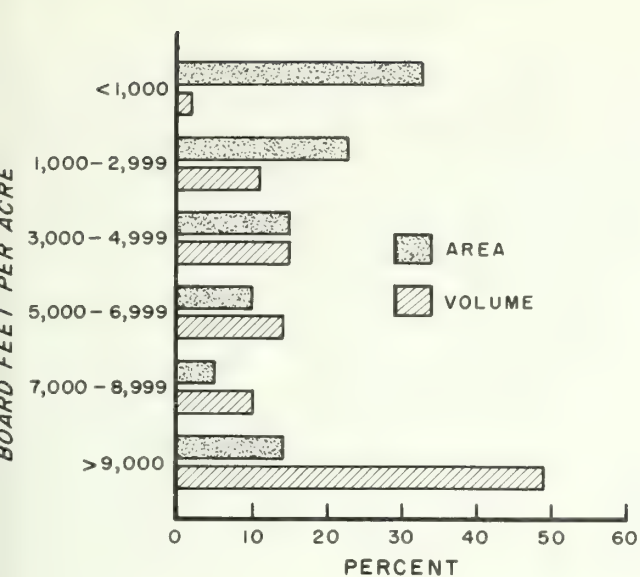


Figure 17a.—Area and hardwood sawtimber volume comparison by volume classes, North Delta unit, Louisiana, 1984.

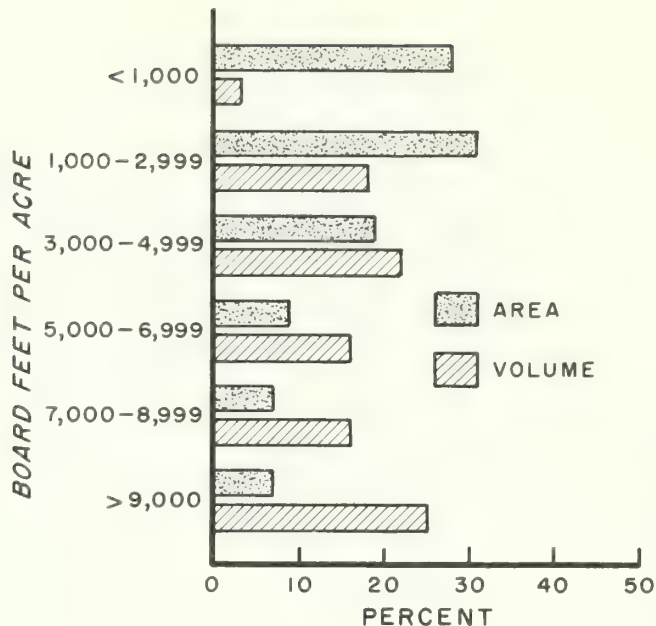


Figure 17b.—Area and hardwood sawtimber volume comparison by volume classes, South Delta unit, Louisiana, 1984.

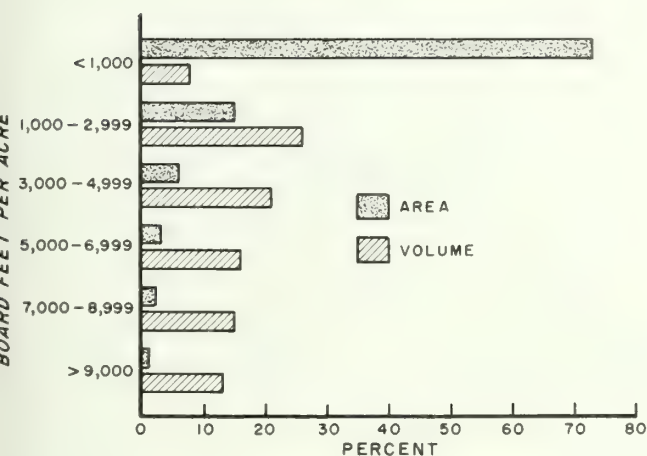


Figure 17c.—Area and hardwood sawtimber volume comparison by volume classes, Southwest unit, Louisiana, 1984.

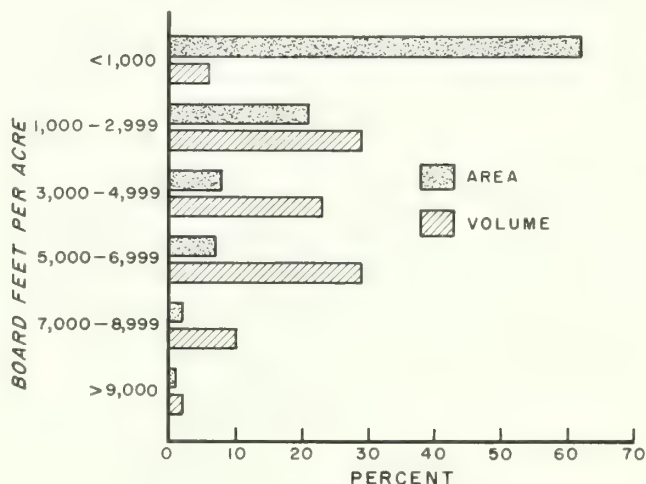


Figure 17d.—Area and hardwood sawtimber volume comparison by volume classes, Southeast unit, Louisiana, 1984.

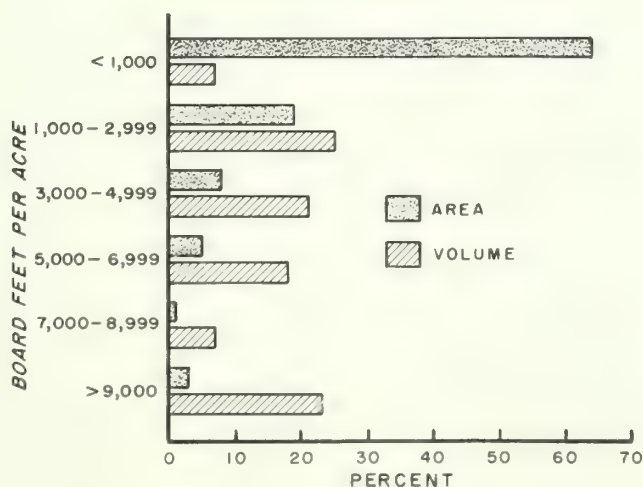


Figure 17e.—Area and hardwood sawtimber volume comparison by volume classes, Northeast unit, Louisiana, 1984.

STAND STRUCTURE

Stand Size

Currently in Louisiana, 59 percent of timberland, 8,178,900 acres, is occupied by sawtimber stands (fig. 18). Twenty percent of the State's timberland is poletimber, 18 percent is sapling and seedling, and 3 percent is nonstocked.

The stand-size proportions are fairly uniform for every unit in the State with 50 to 60 percent timberland in sawtimber, 15 to 25 percent in poletimber, and 15 to 25 percent in sapling and seedling stands. An exception, the South Delta unit, has 76 percent of its timberland in sawtimber stands. Baldcypress is naturally even aged with very few understory trees. Because of the special regeneration requirements of baldcypress, few of these stands are in the sapling and seedling or poletimber size unless there are large amounts of cutting activity. This would most likely increase nonstocked acreage until optimum regeneration conditions occur.

The Northwest and Southwest units have the most timberland in sawtimber stands, 2,444,000 and 2,390,800 acres, respectively. Since the 1974 survey, the South Delta, Southwest, and Northwest units had increased in sawtimber acreage, while the North Delta and Southeast units decreased slightly (table VIII).

Sapling and seedling stands declined, especially in the North Delta, South Delta, and Southwest units. A combination of cutting and acreage decline in these stands with subsequent increases in nonstocked acreage would indicate lack of regeneration after cutting.

Stocking

Since the 1974 survey, there have been some distinct shifts in stocking, Statewide. First, in overstocked stands (100.1 to 160 percent stocked; see Appendix for stocking definitions), the stocking level

for the range as a whole remained relatively stable but significant changes occurred in detailed classes. Timberland increased by 424,000 acres in the 120.1 to 160 percent stocking class but decreased 423,700 acres in the 100.1 to 120 percent stocking class (table IX). Second, acreage has increased in understocked stands (0 to 60 percent) by 777,200 acres. Last, acreage has declined by 1,422,500 acres in the optimally stocked class (60.1 to 100 percent stocked). Louisiana has an increase in acreage of the higher ranges of overstocked and all ranges of understocked stands and a decrease in acreage of optimally stocked stands.

Increases of timberland acreage in the 120.1 to 160 percent stocking range occurred in every unit. The Southwest and Northwest units alone had an increase of 261,300 acres, 62 percent of the total increase in that stocking range.

In understocked stands, every unit had an increase of timberland acreage except the North Delta and South Delta units and there the decrease was only in the 40.1 to 60 percent stocking class. The largest increases in understocked acreage occurred in the Northwest and Southwest units. These two units accounted for 676,800 acres of the 777,200 acre timberland increase in the 0 to 60 percent stocking classes.

Most of the decrease of optimally stocked stands occurred in the 80.1 to 100 percent stocking class (table IX). Although decreases occurred in all the units, the Southwest and Northwest units accounted for 671,200 acres in this class alone. Other substantial decreases totaling 645,700 acres occurred in both Delta units in the optimally stocked class.

On nonindustrial private timberland optimally stocked stands decreased by 1,100,200 acres (table X). Overstocked stands increased 88,900 acres. However, substantial increases in the 120.1 to 160 percent range were offset by a 132,800-acre decline in the 100.1 to 120 percent stocking range. Understocked stand acreage increased by 397,600 acres. Currently, 2,772,500 acres (31 percent) of private timberland are classed in the understocked category, 2,503,700 acres

Table VIII.—Percent change in timberland by stand size and forest survey units, Louisiana, 1974-1984¹

Forest survey units	Sawtimber		Poletimber		Sapling and seedling		Nonstocked	
	Area	Change	Area	Change	Area	Change	Area	Change
	Thousand acres	Percent	Thousand acres	Percent	Thousand acres	Percent	Thousand acres	Percent
North Delta	566.0	-12	183.0	-40	115.1	-46	49.4	+179
South Delta	1,806.7	+7	356.5	-36	101.4	-56	126.8	+26
Southwest	2,390.8	+6	937.1	-14	974.0	-10	114.9	+12
Southeast	971.4	-4	304.0	+11	427.2	-4	48.5	-9
Northwest	2,444.0	+7	938.4	-21	908.2	-3	109.4	+115
All units	8,178.9	+4	2,718.9	-20	2,525.8	-13	449.0	+38

¹ Rows and columns may not sum due to rounding.

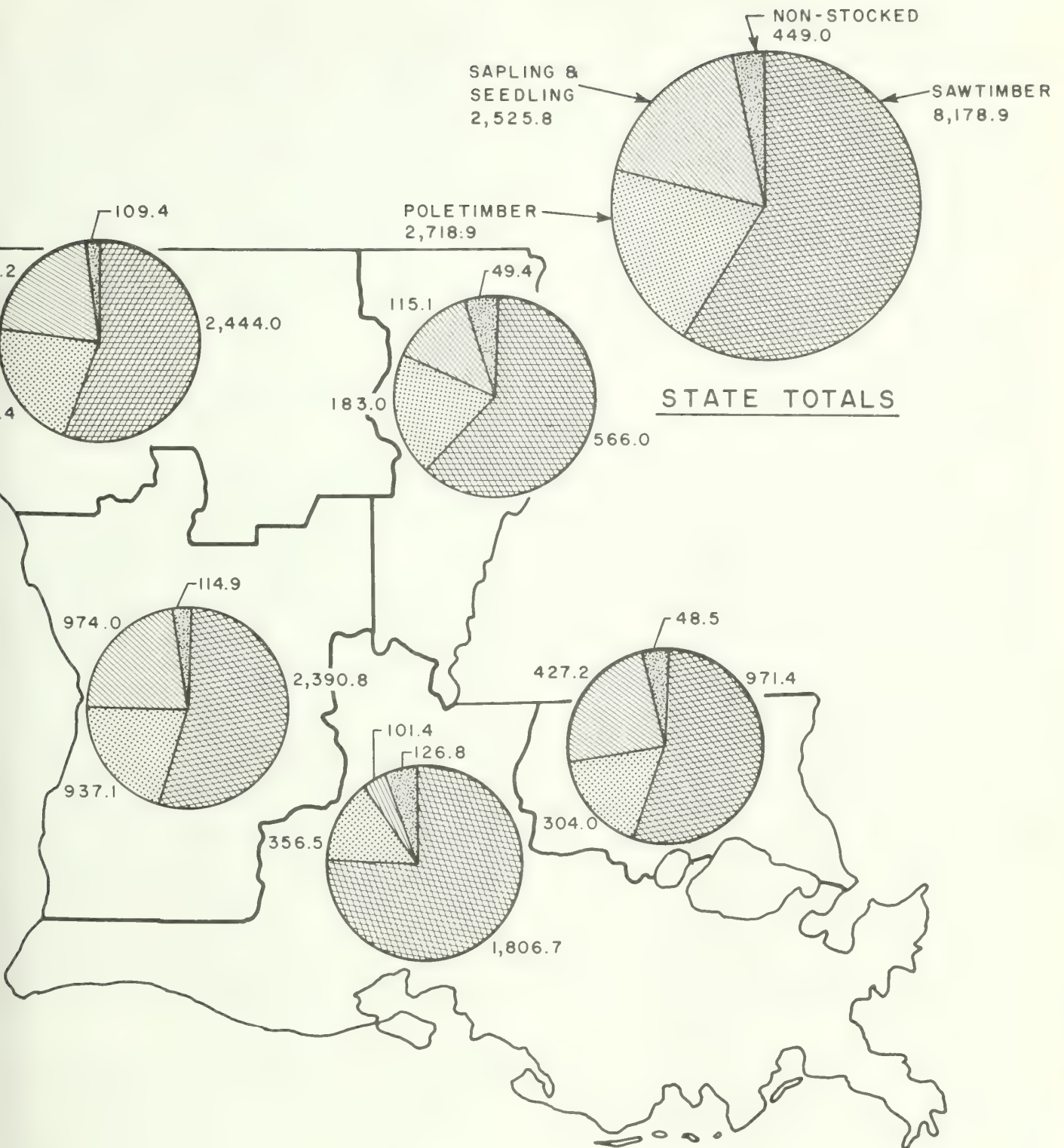


Figure 18.—Proportion of timberland in thousand acres by stand-size classes, Louisiana, 1984.

Table IX.—Area of timberland by forest survey units and detailed stocking class of growing-stock trees, Louisiana, 1974¹ and 1984²

Forest survey units	Stocking class (percent)											
	>140		121-140		101-120		81-100		61-80		41-60	
	1974	1984	1974	1984	1974	1984	1974	1984	1974	1984	1974	1984
Thousand acres												
North Delta	5.9	15.4	23.9	77.6	103.8	116.2	247.6	182.8	448.3	181.5	226.3	170.5
South Delta	46.9	57.2	103.0	129.1	342.9	378.3	541.4	420.6	680.6	487.3	502.1	482.5
Southwest	29.1	131.3	360.7	393.5	1,060.1	670.3	1,228.1	1,022.1	916.3	992.5	557.6	650.9
Southeast	17.3	37.4	100.9	143.6	310.4	281.9	463.1	369.5	392.3	369.7	285.8	298.8
Northwest	62.7	138.6	420.6	471.0	975.6	922.4	1,373.1	907.9	981.7	916.1	468.2	631.0
All units	161.9	380.1	1,009.1	1,214.9	2,792.8	2,369.1	3,853.3	2,902.9	3,419.2	2,947.1	2,039.9	2,233.7
											856.7	1,243.9
											384.7	580.9

¹ Area totals of 1974 estimates do not equal 1974 published data because of different rounding procedures.² Rows and columns may not sum due to rounding.Table X.—Area of timberland by ownership and detailed stocking class of growing-stock trees, Louisiana, 1974¹ and 1984²

Ownership Class	Stocking class (percent)											
	>140		121-140		101-120		81-100		61-80		41-60	
	1974	1984	1974	1984	1974	1984	1974	1984	1974	1984	1974	1984
Thousand acres												
Public	0.0	12.0	76.0	113.7	262.4	173.5	343.9	290.5	260.1	304.2	162.0	267.4
Forest industry	39.6	140.4	324.4	376.3	846.4	644.6	1,148.6	811.2	757.3	781.5	485.0	517.9
Nonindustrial private	122.2	227.7	608.7	724.9	1,683.9	1,551.1	2,360.8	1,801.2	2,402.0	1,861.4	1,392.9	1,448.4
All ownerships	161.8	380.1	1,009.1	1,214.9	2,792.7	2,369.1	3,853.3	2,902.9	3,419.4	2,947.1	2,039.9	2,233.6
											856.7	1,243.9
											384.6	580.9

¹ Area totals of 1974 estimates do not equal 1974 published data because of different rounding procedures.² Rows and columns may not sum due to rounding.

28 percent) are overstocked, and 3,662,600 acres (41 percent) are optimally stocked.

Similar trends were evident on forest industry lands except in the optimum stocking range. There, the acreage decreases occurred in the 80.1 to 100 percent range, 337,400 acres. Overstocked stands decreased by 49,100 acres, with a 152,700-acre increase in the upper part of the stocking range (120.1 to 160 percent) being offset by a 201,800-acre decrease in the 100.1 to 120 percent stocking class. Understocked timberland on forest industry land increased by 201,000 acres since 1974. Most of this increase was in the 20.1 to 40 percent stocking range. An increasing time lapse between cutting and stand regeneration could contribute significantly to the increase in understocked stands. A total of 849,100 acres (24 percent) of forest industry land is in the understocked condition, 1,161,300 acres (32 percent) are overstocked, and 1,592,700 acres (44 percent) are optimally stocked.

On public lands, there was no change in the acreage of optimally stocked stands, however, a decrease in the upper part of that range did offset an increase in the lower part of the range. Overstocked timberland decreased by 39,200 acres but there was a 49,700-acre increase in the upper portion of the stocking range. Understocked stands increased by 178,700 acres, mainly because stand regeneration has fallen behind cutting. Currently, 436,900 acres (33 percent) of public timberland are in an understocked condition, 299,200 acres (22 percent) are overstocked, and 594,700 acres (45 percent) are optimally stocked.

Since the 1974 survey there has been a 532,700-acre increase in understocked sawtimber stands (table XI). Louisiana currently has 2,066,100 acres of sawtimber stands in the understocked class. Optimally stocked sawtimber stand acreage has remained relatively stable with the exception of the 80.1 to 100 percent class. This class declined by 483,200 acres.

Poletimber stands have decreased in the optimum stocking range by 412,100 acres and decreased in the overstocked class by 509,800 acres. In the understocked class, these stands increased slightly by 233,500 acres.

Sapling and seedling stands decreased by 112,600 acres in the understocked class, by 407,800 acres in the optimally stocked class, and increased by 136,800 acres in the overstocked class (table XI). The decline of acreage in the optimally stocked sapling and seedling stands is cause for concern because of the impact on Louisiana's future growing stock inventory.

The longleaf-slash pine forest type stocking situation has been relatively stable since 1974. This is expected since most of these stands are in plantation management in Louisiana. Approximately 22 percent of the stands in this type are understocked (table XII).

The stocking of the loblolly-shortleaf forest type can

vary more widely than the longleaf-slash type, because of the combination of natural stands with lack of management coming into play. This creates instability in stand stocking, but such was not true in Louisiana. Optimally stocked stand acreage has remained unchanged since 1974. There was, however, a decrease in the 80.1 to 100 percent stocking range offsetting an increase in the 60.1 to 80 percent range. Overstocked acreage has decreased by 160,100 acres. Currently, 360,400 acres of the loblolly-shortleaf type are understocked, 9 percent of the type. Plantation management and prolific seeding habits of shortleaf and loblolly keep understocked acreage low.

The oak-pine forest type lost 316,200 acres of optimally stocked stands since 1974. Acreage decreased in the 100.1 to 120 percent stocking range, but that was offset by higher acreage in the upper ranges of the overstocked category. Still, overstocked oak-pine stands declined by 65,700 acres. Understocked stands increased by 90,400 acres; currently, 19 percent of the oak-pine forest type is in understocked stands.

In the oak-hickory forest type, understocked acreage increased substantially, 512,100 acres since 1974. Optimally stocked acreage declined by 200,400 acres, while overstocked stands increased by 134,300 acres. It appears that as stands are cut over, pine removal is sufficient to shift the forest type. This is the primary reason 49 percent of Louisiana's oak-hickory type is in an understocked condition.

A similar situation has arisen in Louisiana's bottomland forest types. Forty-two percent of the acreage of these types is in an understocked condition. Optimally stocked stands have declined by 860,700 acres, caused mostly by heavy cutting and land clearing. Overstocked stands have increased slightly by 126,000 acres. Nearly 18 percent of the State's bottomland types are overstocked. Nevertheless, past heavy cutting and landclearing has seriously depleted these stands overall.

Table XIII depicts growing-stock volume by detailed stocking levels. Volume has decreased in optimally stocked stands in all units except the Southwest. There, volume increased by 217 million cubic feet. Currently, the State has 7,958 million cubic feet of growing stock in optimally stocked stands. There are 8,628 million cubic feet in overstocked stands and 2,406 million cubic feet in understocked stands. These are increases of 29 and 46 percent, respectively, over those reported in 1974. All of the survey units had increases in volume in their respective stocking classes of understocked and overstocked stands.

Sawtimber volume changed little in the optimally stocked class and is currently 30,000 million board feet (table XIV). Significant volume declines were registered since 1974 in all the survey units except the Southwest. The Southwest unit offset other unit declines with a 895-million board feet increase.

Table XI.—Area of timberland by size class and detailed stocking class of growing-stock trees, Louisiana, 1974¹ and 1984²

Size Class	Stocking class (percent)															
	>140		121-140		101-120		81-100		61-80		41-60		21-40		0-20	
	1974	1984	1974	1984	1974	1984	1974	1984	1974	1984	1974	1984	1974	1984	1974	1984
..... Thousand acres																
Sapling and seedling	39.4	128.8	206.9	264.1	459.9	450.1	738.1	524.0	656.0	462.3	500.1	362.8	278.4	262.2	30.7	71.6
Poetimber	58.8	71.4	331.9	224.6	819.8	404.7	790.1	537.0	793.3	634.3	369.9	517.0	226.5	298.9	17.0	31.0
Sawtimber	63.6	179.9	470.4	726.2	1,513.0	1,514.4	2,325.1	1,841.9	1,970.0	1,850.5	1,170.0	1,354.0	351.8	682.8	11.6	29.3
Nonstocked	...	...	...	...	...	...	...	...	...	...	...	...	...	...	325.3	449.0
All classes	161.8	380.1	1,009.1	1,214.9	2,792.8	2,369.2	3,853.3	2,902.9	3,419.2	2,947.1	2,039.9	2,223.7	856.7	1,243.9	384.7	580.9

¹ Area totals of 1974 estimates do not equal 1974 published data because of different rounding procedures.² Rows and columns may not sum due to rounding.Table XII.—Area of timberland by detailed stocking class and forest type, Louisiana, 1971¹ and 1984²

Forest type	Stocking class (percent)															
	>140		121-140		101-120		81-100		61-80		41-60		21-40		0-20	
	1974	1984	1974	1984	1974	1984	1974	1984	1974	1984	1974	1984	1974	1984	1974	1984
..... Thousand acres																
Longleaf-slash	28.8	42.1	75.2	94.3	252.3	185.9	226.1	217.3	197.8	191.9	129.6	130.6	72.8	53.6	40.9	17.6
Loblolly-shortleaf	57.4	224.0	638.9	627.2	1,408.2	1,093.2	1,289.7	971.1	469.3	757.4	142.5	255.1	28.3	86.8	34.4	18.5
Oak-pine	11.5	22.3	113.9	151.8	434.3	319.9	811.5	543.9	553.7	505.1	233.7	266.3	34.9	92.9	11.2	11.0
Oak-hickory	16.5	22.9	28.9	101.6	155.7	210.9	425.1	284.1	541.5	482.1	332.2	543.8	155.5	376.8	69.2	148.5
Oak-gum-cypress ³	47.6	68.7	152.2	240.0	542.2	559.3	1,100.8	886.5	1,657.0	1,010.6	1,201.9	1,038.0	565.2	633.8	229.0	353.0
All types ⁴	161.8	380.1	1,009.1	1,214.9	2,792.8	2,369.2	3,853.3	2,902.9	3,419.2	2,947.1	2,039.9	2,233.7	856.7	1,243.9	384.7	580.9

¹ Area totals of 1974 estimates do not equal 1974 published data because of different rounding procedures.² Rows and columns may not sum due to rounding.³ Includes 412,400 acres of elm-ash-cottonwood type.⁴ The 1984 figures do not include 32,400 acres of nontyped timberland.

Table XIII.—Volume of growing stock by forest survey units and detailed stocking class, Louisiana, 1974¹ and 1984²

Forest survey units	Stocking class (percent)											
	>140		121-140		101-120		81-100		61-80		41-60	
	1974	1984	1974	1984	1974	1984	1974	1984	1974	1984	1974	1984
<i>Million cubic feet</i>												
North Delta	10.4	13.6	32.0	162.0	216.1	303.3	363.2	312.6	462.2	240.5	171.9	162.4
South Delta	196.0	296.6	356.6	435.3	748.8	1,072.4	841.8	791.8	713.7	675.0	333.1	399.3
Southwest	73.8	244.2	608.1	860.5	1,560.8	1,212.6	1,520.7	1,481.6	801.7	1,057.9	329.9	456.5
Southeast	40.3	75.2	135.7	332.8	506.4	521.1	638.4	539.0	369.9	430.9	176.8	218.2
Northwest	70.6	300.1	675.9	985.4	1,440.8	1,813.1	1,636.3	1,330.3	1,012.2	1,098.2	327.5	534.4
All units	391.1	929.7	1,808.3	2,776.1	4,472.9	4,922.5	5,000.5	4,455.5	3,359.7	3,502.2	1,339.1	1,770.8
											282.6	559.9
											30.3	75.3

¹ Volume totals of 1974 estimates do not equal 1974 published data because of different rounding procedures.² Rows and columns may not sum due to rounding.Table XIV.—Volume of sawtimber by forest survey units and detailed stocking class, Louisiana, 1974¹ and 1984²

Forest survey units	Stocking class (percent)											
	>140		121-140		101-120		81-100		61-80		41-60	
	1974	1984	1974	1984	1974	1984	1974	1984	1974	1984	1974	1984
<i>Million board feet³</i>												
North Delta	4.8	28.2	19.4	560.0	843.6	1,188.0	1,461.4	1,249.2	1,696.4	1,000.2	656.3	622.6
South Delta	735.1	1,031.0	1,169.4	1,353.5	2,436.5	3,596.0	2,949.0	2,650.1	2,442.5	2,130.7	1,143.3	1,277.2
Southwest	222.7	1,006.0	1,948.6	3,263.5	5,688.1	5,810.0	5,955.4	5,810.0	3,063.2	4,104.1	1,255.9	1,721.7
Southeast	188.2	216.3	443.2	1,117.9	1,798.2	1,915.2	2,447.0	2,095.0	1,423.4	1,541.9	641.7	855.6
Northwest	103.9	971.7	2,351.3	3,710.4	5,193.2	7,212.5	6,259.3	5,202.4	3,994.4	4,216.5	1,239.5	2,064.0
All units	1,254.7	3,253.3	5,931.9	10,005.2	15,959.6	18,687.3	19,072.1	17,006.5	12,619.9	12,993.4	4,936.7	6,541.1
											985.2	2,010.0
											91.9	238.3

¹ Sawtimber totals of 1974 estimates do not equal 1974 published data because of different rounding procedures.² Rows and columns may not sum due to rounding.³ International 1/4-inch rule.

Sawtimber volume also increased substantially in the overstocked and understocked classes. Forty-five percent of Louisiana's sawtimber is in overstocked stands and 12 percent is in understocked stands. All of the survey units showed increases of sawtimber in overstocked and understocked stands. The Northwest unit had an exceptional increase in overstocked stands, from 7,648 million board feet in 1974 to 11,895 million board feet, currently.

Species Distribution

The distribution of tree species across the Louisiana landscape is by no means homogeneous. Instead, particular species have more importance (using volume as the importance value) in different areas of the State. Figures 19 through 31 portray the relative distribution of the more important softwoods and hardwoods. These particular maps illustrate species distribution by volume of growing-stock trees only; relative locations are based upon county volume rather than plot volume.

Loblolly is the most important and extensively distributed softwood in Louisiana (fig. 19). Its range

covers the western, northern, and southeast areas of the State. Shortleaf, once dominant in the Northwest, is becoming sporadic in distribution with no heavy concentration approaching that of loblolly pine (fig. 20). This is because harvested (cut) shortleaf pine is being replaced by loblolly pine, both naturally and artificially. Longleaf pine and slash pine are concentrated in the west central and southeast portions of Louisiana (fig. 21 and 22). These areas of Louisiana were once covered predominantly with longleaf pine, but longleaf regeneration problems have created preference for slash pine. Between 1974 and 1984, approximately 95,000 acres of harvested longleaf were converted to slash pine. Currently, despite improved techniques and knowledge about longleaf establishment, longleaf pine is still declining in Louisiana while slash pine is increasing.

The largest concentration of baldcypress is found in the Atchafalaya Basin but there is also significant concentration in the north central area on lowlands bordering the Ouachita River and its tributaries (fig. 23). Baldcypress is limited in the North Mississippi Delta and is sporadic in the Red River Basin.

Water tupelo is also heavily concentrated in the Atchafalaya Basin (fig. 24). It is virtually nonexistent in

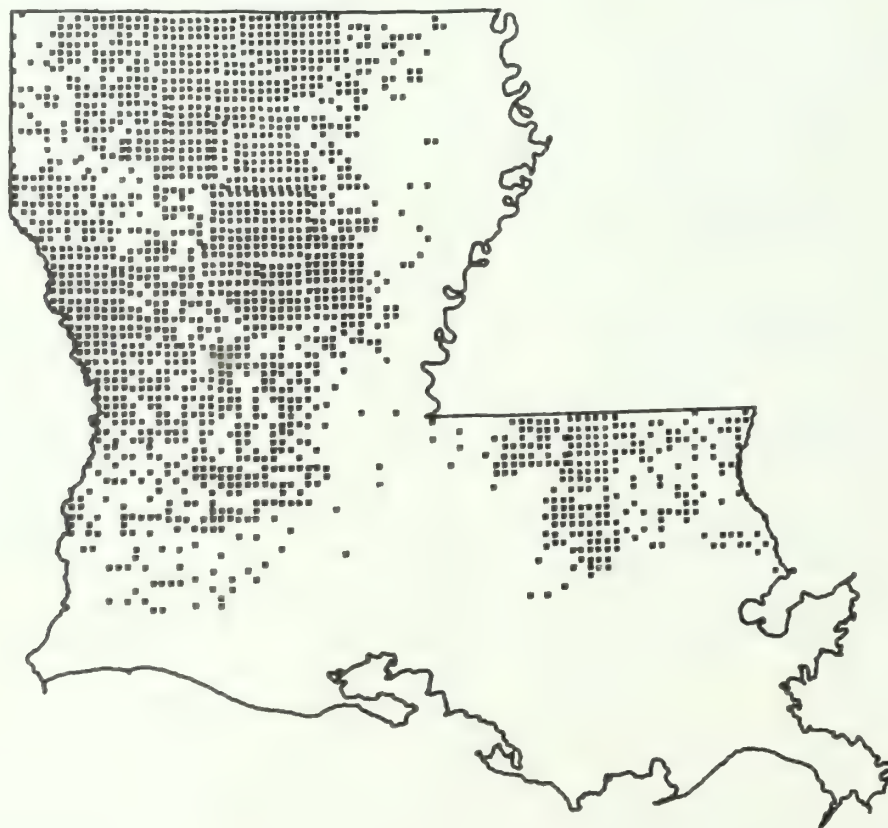


Figure 19.—Distribution of loblolly pine, Louisiana, 1984. Each dot represents 5,000,000 cubic feet.



Figure 20.—Distribution of shortleaf pine, Louisiana, 1984. Each dot represents 5,000,000 cubic feet.

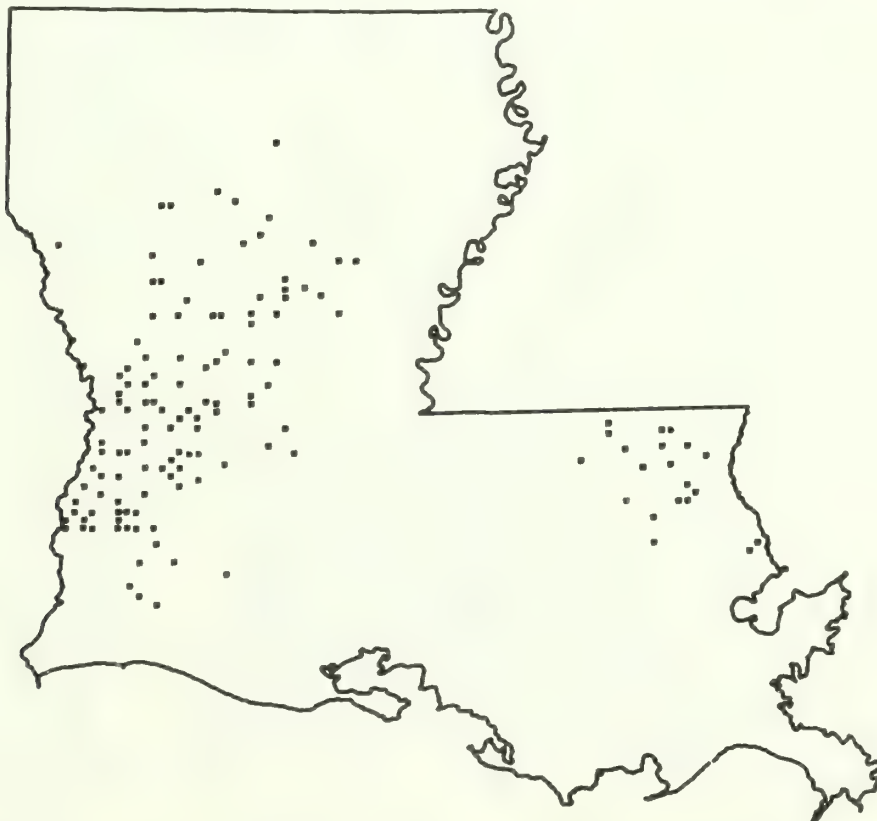


Figure 21.—Distribution of longleaf pine, Louisiana, 1984. Each dot represents 5,000,000 cubic feet.

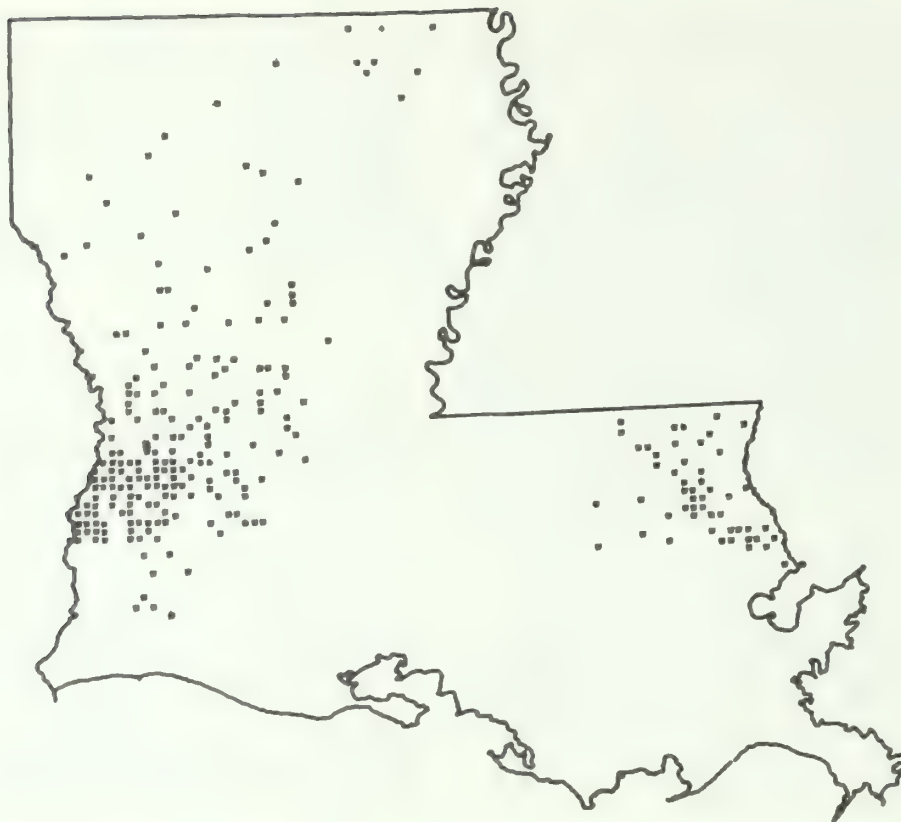


Figure 22.—Distribution of slash pine, Louisiana, 1984. Each dot represents 5,000,000 cubic feet.

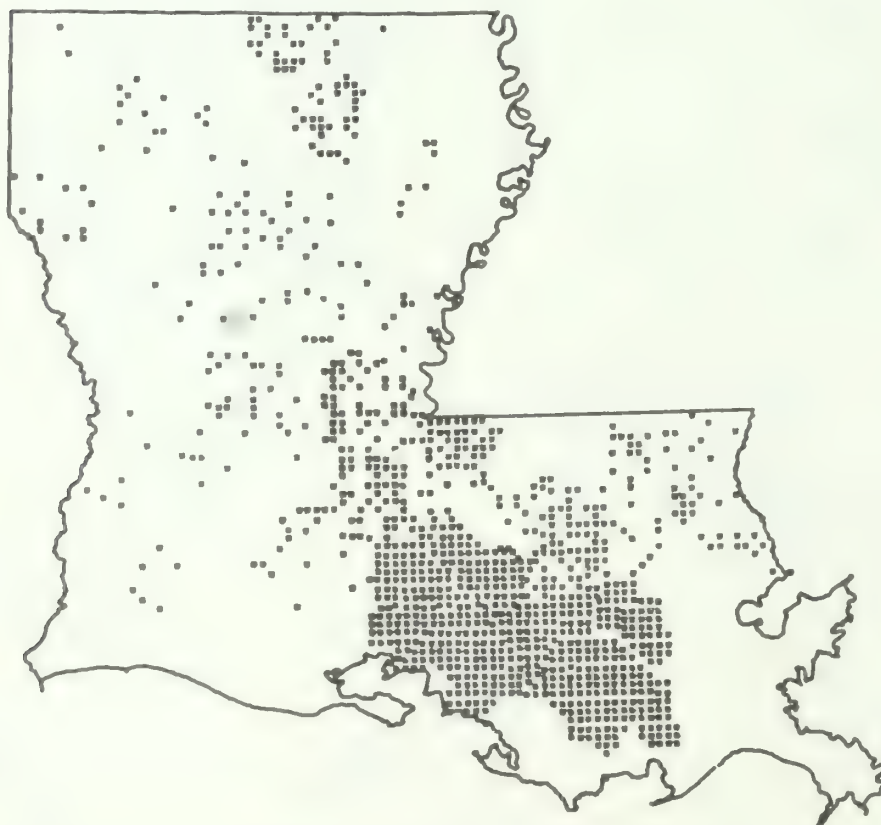


Figure 23.—Distribution of baldcypress, Louisiana, 1984. Each dot represents 1,000,000 cubic feet.

the northern portion of the Mississippi Delta and in the Red River Basin. A notable concentration exists in the northern portion of the State along the Ouachita River.

Five of the principal oaks in Louisiana were mapped, 2 upland (white oak and southern red oak) and 3 lowland oaks (cherrybark oak, willow oak, and water oak). White oak and southern red oak have similar ranges, but the concentration of southern red oak is higher, especially in the north and northwest areas of the State (fig. 25 and 26).

Cherrybark oak is fairly evenly distributed across the State, except in the north Mississippi Delta. There is a fairly high concentration east of the Mississippi River in the southeastern part of the State (fig. 27).

Since willow oak is confined mainly to lowland soils, its distribution is somewhat limited (fig. 28). Willow oak, however, is abundant in the north Mississippi Delta and also in the Ouachita and Red River Basins. Water oak has a wider distribution because of its occurrence on both lowland and upland sites (fig. 29). It, too, is one of the few significant hardwoods in the northern Mississippi Delta.

Sweetgum is the most widely dispersed species in Louisiana (fig. 30). It occurs on all sites but develops best on well-drained lowland areas. It is abundant in

the north Mississippi Delta but heaviest concentrations are in the northcentral portion of the State.

Blackgum is most prevalent in the flatwoods areas of the southeast and western areas of the State (fig. 31). However, it is also abundant in the northcentral portion of Louisiana.

Table XV ranks by unit all live trees using stem volume as the importance value. Importance here refers to a measurement by which the species in a community can be compared and ranked (Whittaker 1975). Readily apparent is the dominance of loblolly pine in all the survey units except the South Delta. Loblolly pine is co-dominant with sweetgum in the North Delta unit because of its extensive occurrence on the Macon Ridge.

The degree of species diversity varies among the different forest survey units. The lowland units have more even distribution of importance among species where no single species clearly outranks all others. In the North Delta unit 12 species account for three-fourths of the total importance value: loblolly pine, sweetgum, willow, water oak, overcup oak, willow oak, cottonwood, water hickory, sugarberry, green ash, Nuttall oak, and cedar elm. Seven species make up three-fourths of the total species importance in the South Delta unit: baldcypress, water tupelo, green ash,

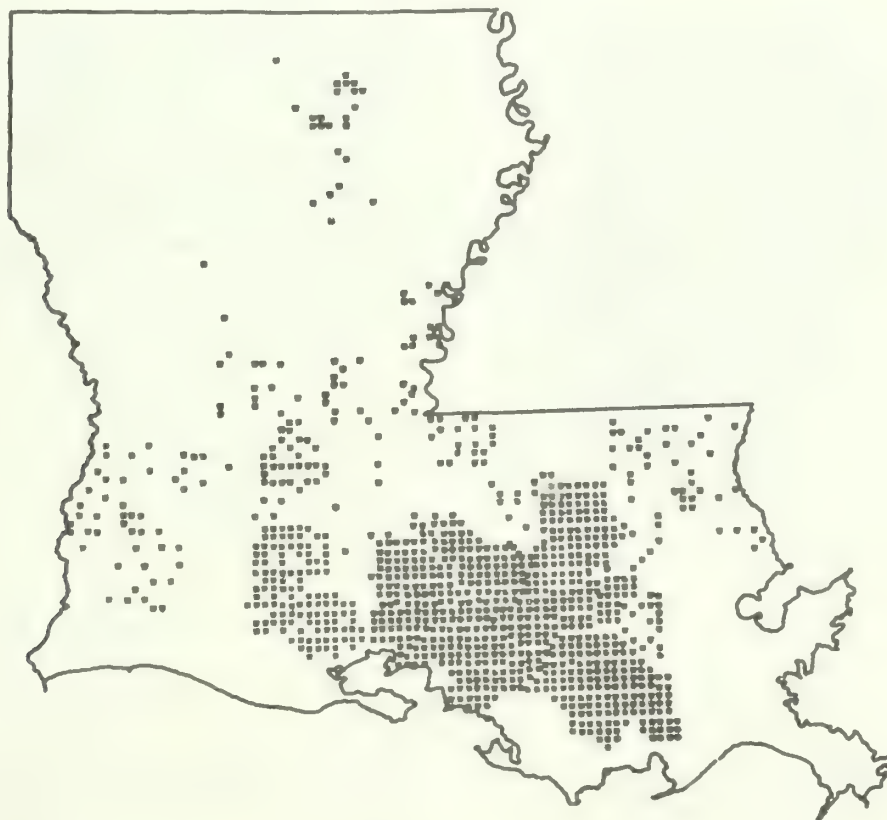


Figure 24.—Distribution of water tupelo, Louisiana, 1984. Each dot represents 500,000 cubic feet.

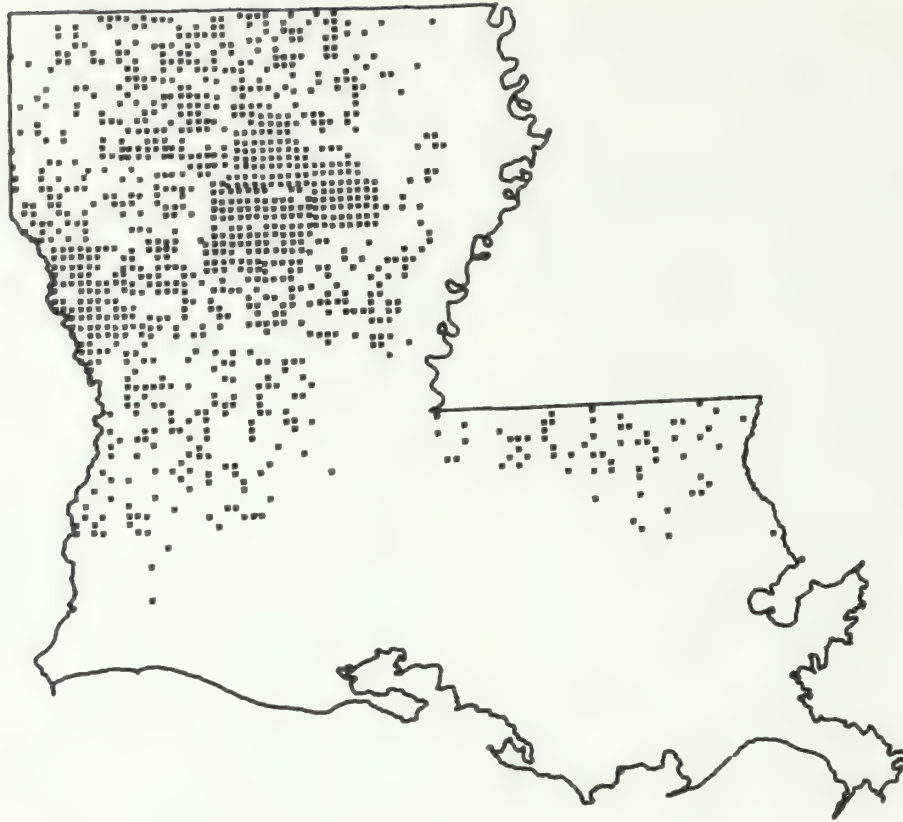


Figure 25.—Distribution of white oak, Louisiana, 1984. Each dot represents 500,000 cubic feet.

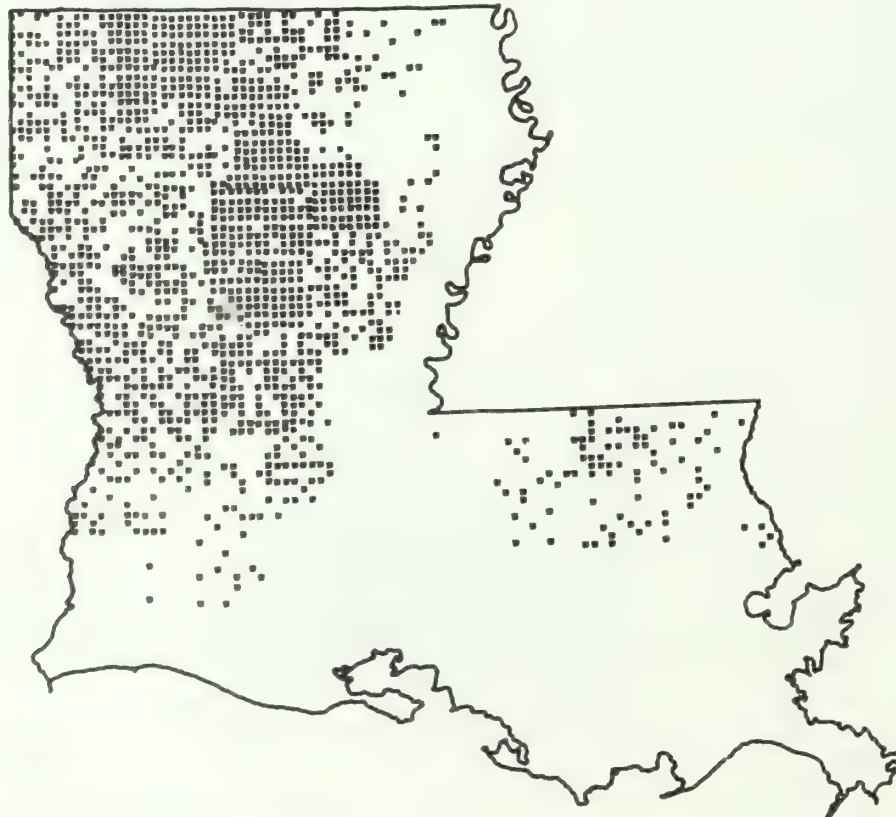


Figure 26.—Distribution of southern red oak, Louisiana, 1984. Each dot represents 500,000 cubic feet.

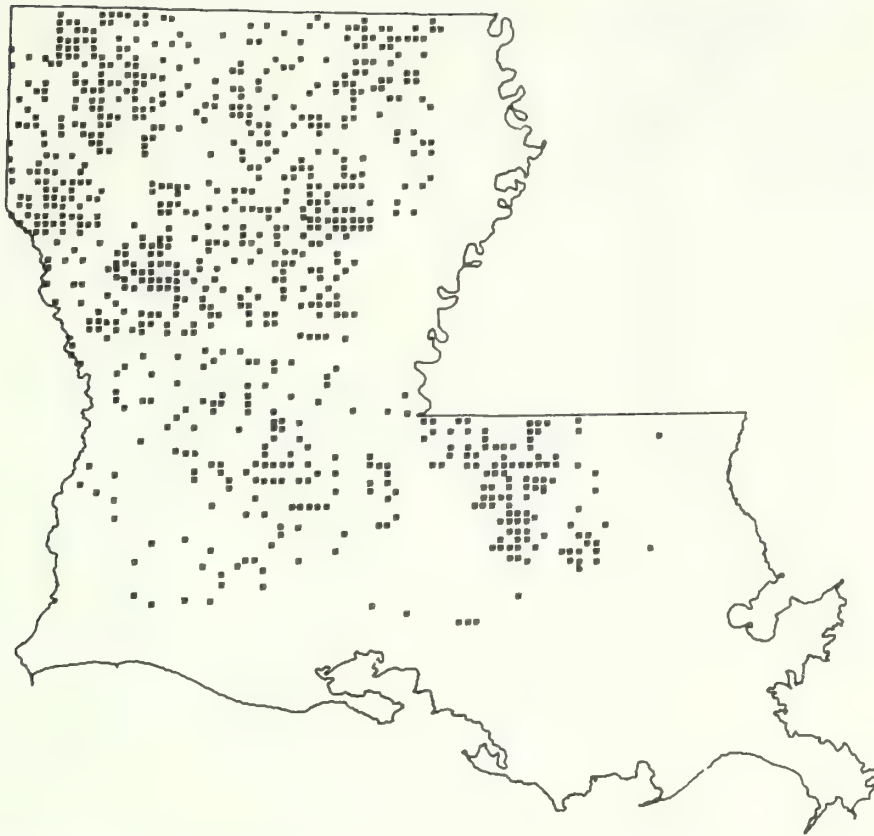


Figure 27.—Distribution of cherrybark oak, Louisiana, 1984. Each dot represents 500,000 cubic feet.

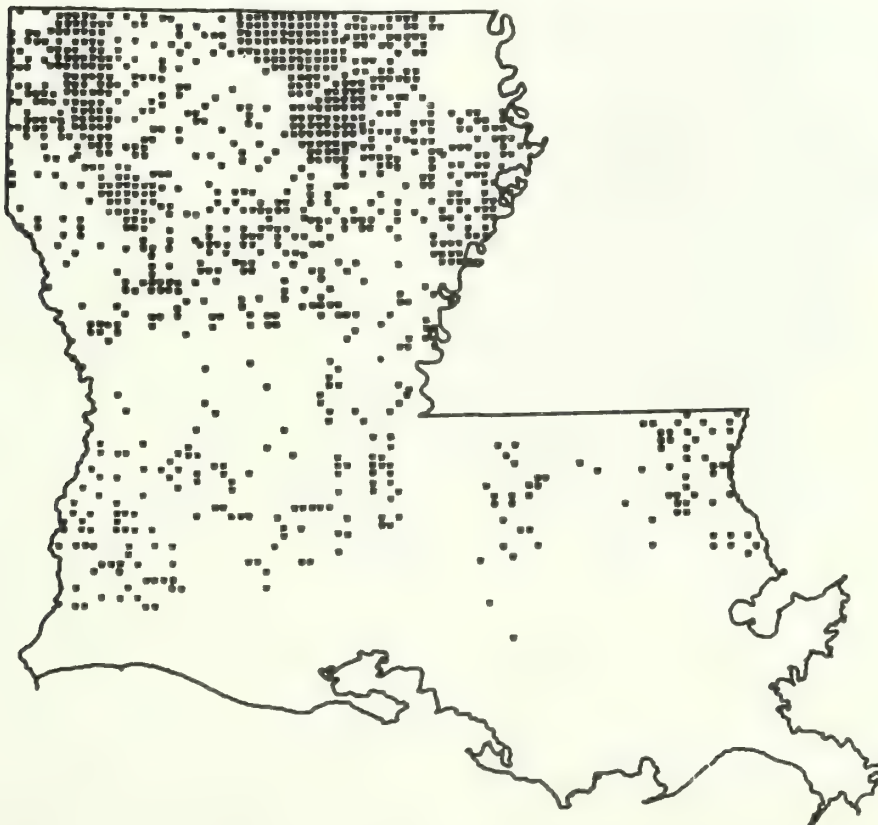


Figure 28.—Distribution of willow oak, Louisiana, 1984. Each dot represents 500,000 cubic feet.

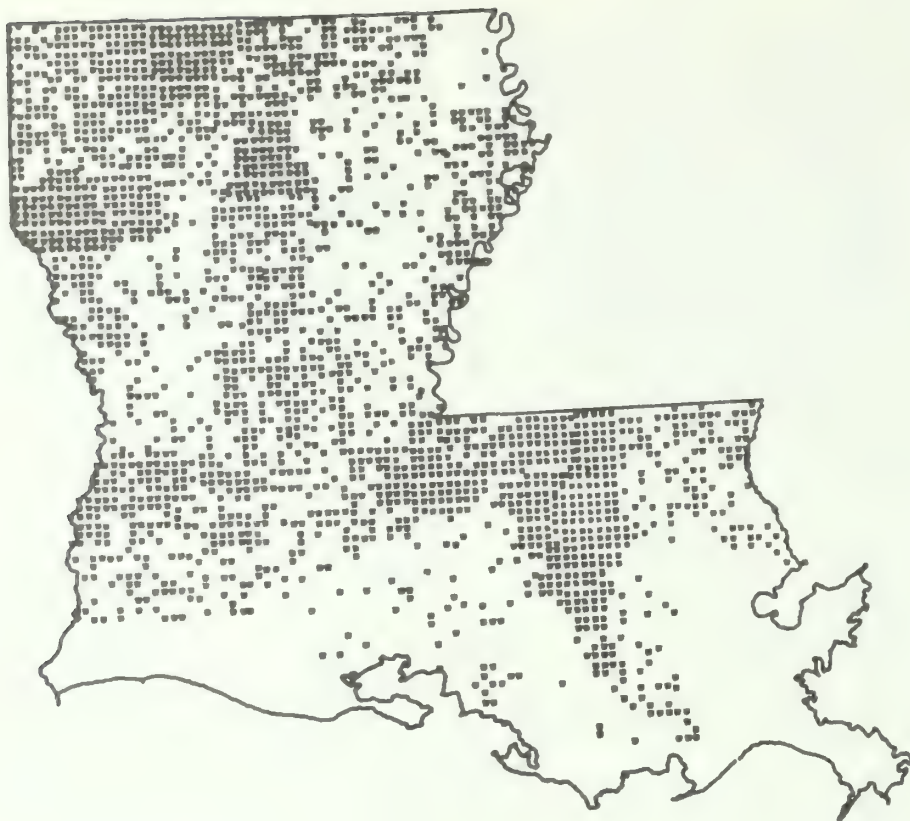


Figure 29.—Distribution of water oak, Louisiana, 1984. Each dot represents 500,000 cubic feet.

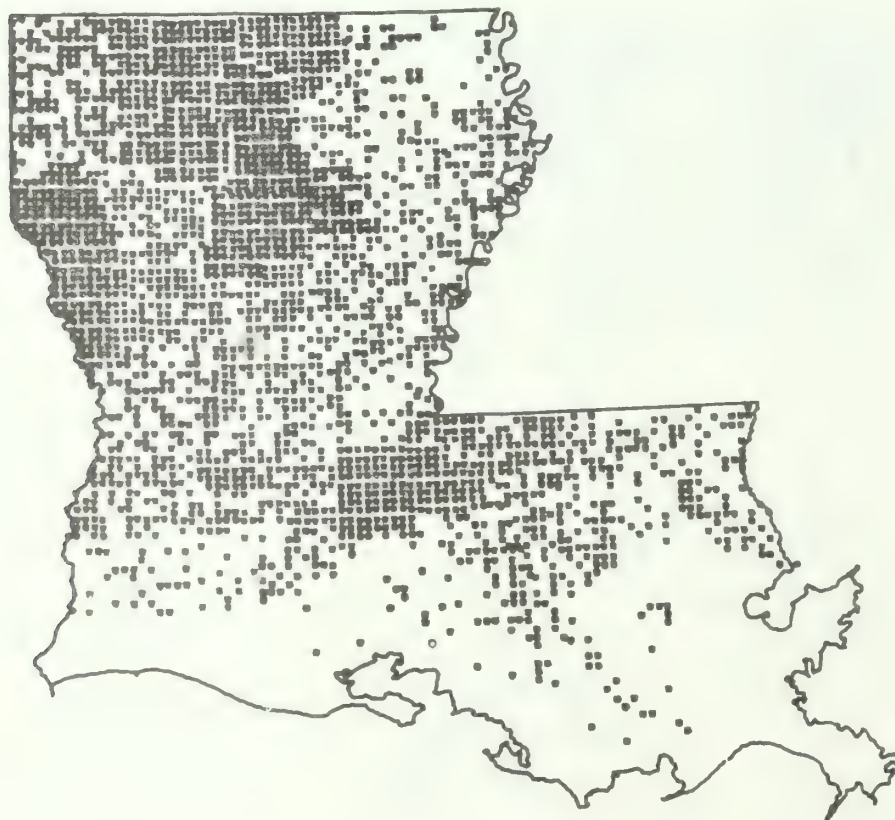


Figure 30.—Distribution of sweetgum, Louisiana, 1984. Each dot represents 1,000,000 cubic feet.

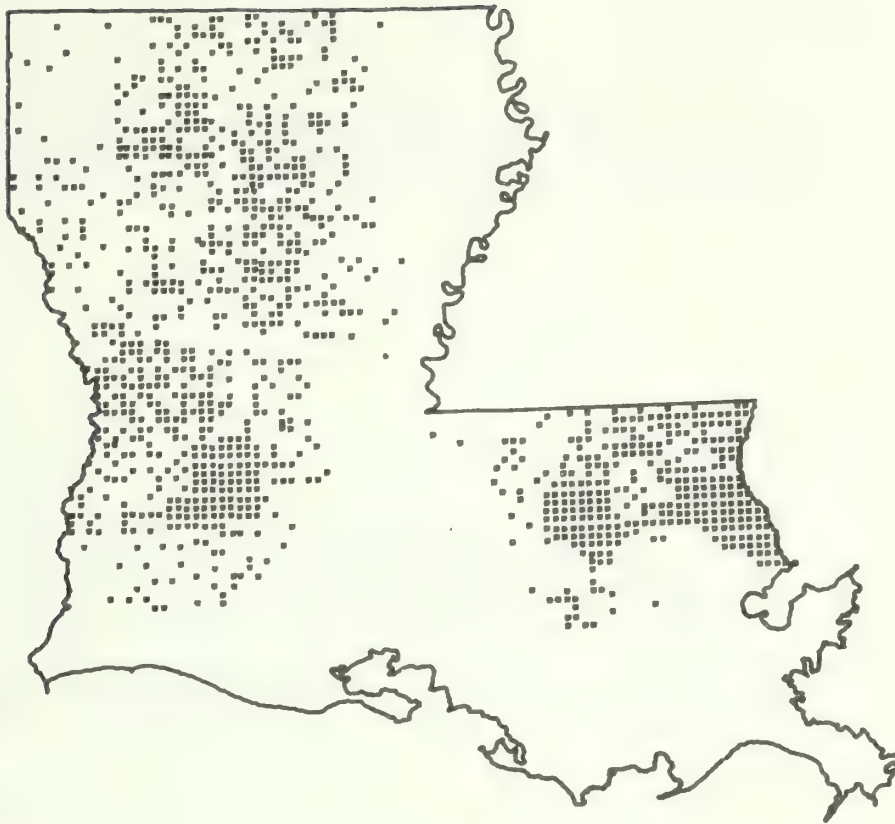


Figure 31.—Distribution of blackgum, Louisiana, 1984. Each dot represents 500,000 cubic feet.

willow, sweetgum, red maple, and sugarberry.

The upland units (Southwest, Southeast, and Northwest), are clearly dominated by loblolly pine. This species accounts for 41, 32, and 40 percent of the importance value, respectively, in each unit. Although the dominance of loblolly pine is substantial in these units, the remainder of importance is equally shared by the other species. Exception might be taken in the Northwest unit where sweetgum and shortleaf pine occupy important codominant positions below loblolly pine but clearly outrank the remaining species.

Change in Number of Trees

Since the 1974 inventory, there have been significant changes in the number of live trees by diameter class. The number of 2-, 4-, 6-, and 8-inch softwood trees has declined sharply (fig. 32) and the increase of trees 10 inches and larger is substantial. Increases were largest in the 16-, 18-, 22-, 24-, 28-, 30-inch, and greater-than-30-inch classes.

When changes between surveys are compared on a per-acre basis, the trend differences remain but they shift somewhat (fig. 33). Comparing the number of trees between surveys on a per acre basis takes into account the loss of timberland acreage that Louisiana

experienced during the current survey period. The number of 2-, 4-, 6-, and 8-inch softwoods is still down from that reported in 1974 but not as much as total number of trees. It appears that approximately 4 percent of the declines in these diameter classes can be attributed to acreage declines. This carries over into the larger diameter classes where the increases in number of softwoods per acre are higher than the change in total number of trees.

The number of hardwoods changed since the 1974 survey but not as dramatically as softwoods. Most significant was the decline of trees in the 4-inch diameter class. Notable increases in the number of hardwoods were most evident in the 22-inch diameter class and larger.

On a per-acre basis, small hardwoods declined 11 percent while larger hardwood diameter classes rose 7 percent. In all likelihood, the increase in the number of stems in the larger size-classes accounts for most of the decrease in the number of smaller stems. Because of increased overstory competition, there is simply less space for saplings and smaller trees. Consequently, a decrease in the number of larger trees should be correlated with a corresponding increase in the number of saplings. This type of density-dependent relationship (Harper 1977) does not account for all the decrease in small-sized trees. When dealing with the forest at a

Table XV.—*Ranking of species' importance by volume, forest survey units, and State, Louisiana, 1984*

North Delta			South Delta			Southwest		
Species	Volume ²	Species	Species	Volume ²	Species	Volume ²	Species	Volume ²
loblolly pine	221.342	baldcypress		1,336.033	loblolly pine	2,808.775		
sweetgum	219.156	water tupelo		902.196	slash pine	628.453		
willow sp.	130.199	green ash		415.715	sweetgum	585.124		
water oak	95.391	willow sp.		400.670	longleaf pine	393.019		
overcup oak	93.980	sweetgum		378.787	shortleaf pine	303.859		
willow oak	91.916	red maple		374.464	water oak	211.525		
cottonwood	83.550	sugarberry		290.846	southern red oak	201.831		
water hickory	79.129	water oak		193.663	black tupelo	177.010		
sugarberry	73.549	American elm		117.028	post oak	131.138		
green ash	61.340	water hickory		110.923	white oak	130.649		
Nuttall oak	57.666	loblolly pine		110.674	cherrybark oak	109.717		
cedar elm	48.286	Nuttall oak		106.424	American beech	105.810		
American sycamore	40.893	cottonwood		85.977	hickory sp.	98.309		
American elm	29.981	overcup oak		62.884	red maple	86.309		
cherrybark oak	27.806	boxelder		60.961	laurel oak	72.776		
honey locust	24.587	American sycamore		45.514	baldcypress	66.167		
baldcypress	23.715	pecan		40.451	bluebeech	64.617		
southern red oak	23.602	cherrybark oak		32.953	green ash	62.311		
pecan	21.539	hickory sp.		23.976	willow oak	60.336		
white oak	20.307	willow oak		22.549	sweetbay	50.209		
boxelder	19.883	other noncommercial species		19.643	water tupelo	46.014		
American beech	14.445	slippery elm		15.139	water hickory	45.126		
winged elm	11.949	live oak		14.847	overcup oak	44.785		
white ash	10.579	shortleaf pine		14.763	swamp chestnut oak	38.870		
slash pine	10.369	swamp chestnut oak		13.159	flowering dogwood	38.199		
persimmon	9.810	water-elm		12.868	blackjack oak	32.269		
shortleaf pine	9.745	bluebeech		12.333	pecan	29.957		
hickory sp.	9.397	pondcypress		11.759	winged elm	29.178		
water tupelo	7.761	laurel oak		11.287	ironwood	23.724		
post oak	7.280	water locust		10.696	southern magnolia	20.322		
slippery elm	6.235	black tupelo		9.989	Nuttall oak	20.060		
laurel oak	6.162	honey locust		9.850	hawthorn	19.852		
swamp chestnut oak	6.006	winged elm		8.905	American holly	19.149		
ironwood	5.148	post oak		8.238	sugarberry	16.120		
hawthorn	4.747	persimmon		7.622	white ash	15.449		

red maple	4.603	hawthorn	5.198	black cherry	11.606
black tupelo	4.198	American beech	4.889	swamp tupelo	11.134
water locust	4.160	flowering dogwood	4.863	American elm	11.018
bluebeech	4.153	yellow-poplar	4.801	sassafras	6.726
flowering dogwood	4.070	swamp tupelo	4.092	sourwood	6.426
black oak	4.025	Shumard oak	3.772	water-elm	5.885
Delta post oak	3.059	white oak	3.759	other noncommercial species	5.078
water-elm	2.953	cedar elm	2.725	American sycamore	4.932
pondycypress	1.502	ironwood	2.716	willow sp.	4.918
yellow-poplar	1.086	redbay	2.627	honey locust	4.706
black cherry	0.727	red mulberry	2.358	sparkleberry	4.459
southern magnolia	0.716	Florida maple	1.970	persimmon	3.821
sourwood	0.673	sassafras	1.791	black oak	3.749
blackjack oak	0.325	black cherry	1.433	plums, cherries (except black cherry)	3.455
plums, cherries (except black cherry)	0.296	spruce pine	1.141	redbay	3.268
gum bumelia	0.279	Delta post oak	1.041	bluejack oak	3.132
sassafras	0.213	pin oak	0.928	Florida maple	2.793
red mulberry	0.204	southern red oak	0.913	yellow-poplar	2.623
Florida maple	0.183	river birch	0.876	American basswood	2.297
eastern redcedar	0.090	sourwood	0.600	Shumard oak	2.092
Shumard oak		southern magnolia	0.449	water locust	1.859
		American holly	0.432	swamp white oak	1.520
		white basswood	0.396	red mulberry	1.513
		plums, cherries (except black cherry)	0.235	boxelder	1.400
		chinaberry	0.201	pond pine	1.357
		blackjack oak	0.077	river birch	1.334
				live oak	1.228
				pin oak	1.098
				eastern redcedar	0.986
				chinkapin	0.754
				Osage orange	0.716
				black locust	0.604
				sugar maple	0.444
				chinaberry	0.346
				bigleaf magnolia	0.314
				eastern redbud	0.123
				southern redcedar	0.036

Table XV.—*Ranking of species¹ importance by volume, forest survey units, and State, Louisiana, 1984—(Continued)*

Southeast		Northwest	
Species	Volume ²	Species	Volume ²
loblolly pine	967.508	loblolly pine	3,198.898
slash pine	194.868	sweetgum	860.172
sweetgum	194.090	shortleaf pine	830.306
water oak	172.635	water oak	353.473
black tupelo	144.746	southern red oak	283.120
spruce pine	129.934	willow oak	252.774
baldcypress	118.823	white oak	206.022
laurel oak	113.972	hickory sp.	188.189
water tupelo	111.732	post oak	161.289
shortleaf pine	62.689	cherrybark oak	143.861
swamp tupelo	61.712	black tupelo	127.489
red maple	58.229	overcup oak	117.896
longleaf pine	51.433	baldcypress	109.346
yellow-poplar	50.888	red maple	107.627
bluebeech	47.537	American beech	82.360
cherrybark oak	40.916	winged elm	76.789
green ash	34.167	water hickory	66.232
sweetbay	31.679	green ash	65.081
willow oak	31.461	bluebeech	59.657
swamp chestnut oak	27.864	laurel oak	38.226
American beech	27.595	American elm	37.160
white oak	27.176	slash pine	35.921
southern red oak	25.798	flowering dogwood	35.406
hickory sp.	25.283	ironwood	35.388
post oak	22.941	sugarberry	30.687
water hickory	22.478	sweetbay	27.774
southern magnolia	21.690	Nuttall oak	25.097
flowering dogwood	18.442	white ash	24.786
pondcypress	17.231	swamp chestnut oak	24.405
American elm	12.226	longleaf pine	21.624
black cherry	10.796	black cherry	20.027
American sycamore	10.013	hawthorn	18.647
other noncommercial species	9.053	American holly	16.430
winged elm	8.194	cottonwood	15.507
American holly	7.609	willow sp.	14.876
ironwood	6.965	cedar elm	14.650
overcup oak	6.069	black oak	13.725
sourwood	6.033	water tupelo	13.688
persimmon	5.249	persimmon	12.728
live oak	5.192	sassafras	10.990
willow sp.	5.184	swamp tupelo	9.711
river birch	5.111	Shumard oak	9.162
water-elm	3.988	honey locust	8.355
blackjack oak	3.493	red mulberry	7.766
sassafras	3.024	pecan	7.517
redbay	2.656	white basswood	7.493
sugarberry	2.553	American sycamore	6.704
honey locust	2.406	water-elm	6.023
chinkapin oak	2.364	plums, cherries (except black cherry)	5.660
cottonwood	2.318	Florida maple	5.521
hawthorn	2.252	eastern redcedar	4.349
black oak	1.329	river birch	3.452
pecan	1.142	black locust	3.335
pin oak	1.052	American basswood	3.088
white ash	1.013	boxelder	2.867
red mulberry	0.871	southern magnolia	2.799
cucumbertree	0.798	red bay	2.724
Nuttall oak	0.624	sourwood	2.658
sparkleberry	0.588	yellow-poplar	2.629
eastern redcedar	0.441	Delta post oak	2.623
plums, cherries (except black cherry)	0.324	slippery elm	2.580
chinaberry	0.292	blackjack oak	2.402
apple sp.	0.291	other noncommercial species	2.197
slippery elm	0.265	water locust	2.031
chinkapin	0.041	sparkleberry	1.998

Table XV.—*Ranking of species¹ importance by volume, forest survey units, and State, Louisiana, 1984—(Continued)*

Northwest - Continued	
Species	Volume ²
sugar maple	1.987
chinaberry	1.914
southern redcedar	1.206
bluejack oak	1.131
eastern redbud	1.116
swamp white oak	0.689
chinkapin	0.625
black walnut	0.337
bigleaf magnolia	0.114
hackberry	0.067
chestnut oak	0.038

Table XV.—*Ranking of species¹ importance by volume, forest survey units, and State, Louisiana, 1984—(Continued)*

State			
Species	Volume ²	Species	Volume ²
loblolly pine	7,307.197	black cherry	44.949
sweetgum	2,237.329	American holly	43.620
baldcypress	1,654.084	persimmon	39.230
shortleaf pine	1,221.362	blackjack oak	38.914
water tupelo	1,081.392	other noncommercial species	35.972
water oak	1,026.687	slippery elm	35.846
slash pine	869.610	pondcypress	31.943
green ash	638.613	water-elm	31.823
red maple	631.305	black oak	23.913
willow sp.	555.847	sassafras	22.811
southern red oak	535.265	live oak	21.267
longleaf pine	466.076	water locust	18.784
blackgum	463.835	sourwood	16.434
willow oak	459.037	Shumard oak	15.116
sugarberry	413.755	red mulberry	12.720
white oak	387.913	redbay	11.274
cherrybark oak	355.253	river birch	10.773
hickory sp.	345.154	Florida maple	10.488
post oak	330.885	plums, cherries (except black cherry)	9.998
overcup oak	325.614	white basswood	7.889
water hickory	323.888	sparkleberry	7.046
laurel oak	242.422	Delta post oak	6.648
American beech	235.099	eastern redcedar	5.959
Nuttall oak	209.871	American basswood	5.386
American elm	207.412	bluejack oak	4.263
blue beech	188.303	black locust	3.938
cottonwood	187.352	pin oak	3.078
winged elm	135.014	chinaberry	2.753
spruce pine	131.075	sugar maple	2.431
swamp chestnut oak	110.304	chinkapin oak	2.364
sweetbay	109.661	swamp white oak	2.209
American sycamore	108.057	chinkapin	1.420
flowering dogwood	101.062	pond pine	1.357
pecan	100.605	southern redcedar	1.242
swamp tupelo	86.648	eastern redbud	1.240
boxelder	85.111	cucumbertree	0.798
ironwood	73.940	Osage orange	0.716
cedar elm	65.661	bigleaf magnolia	0.428
yellow-poplar	62.442	black walnut	0.337
white ash	58.693	gum bumelia	0.296
hawthorn	50.696	apple sp.	0.291
honey locust	49.904	hackberry	0.067
southern magnolia	45.988	chestnut oak	0.038

¹ Scientific names can be cross referenced in species list in Appendix.² Values are net cubic foot volume in million cubic feet for all live trees $\geq$ 1.0 inch in diameter at breast height.

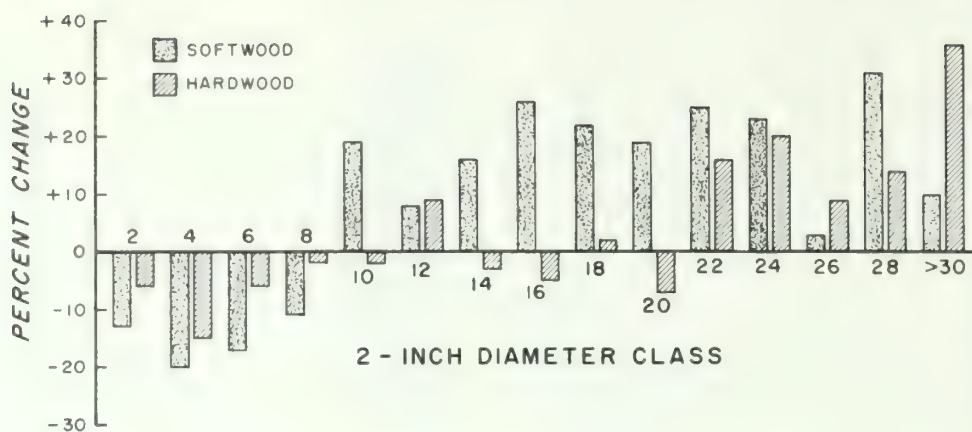


Figure 32.—Percent change in total number of live trees between 1974 and 1984 Louisiana surveys.

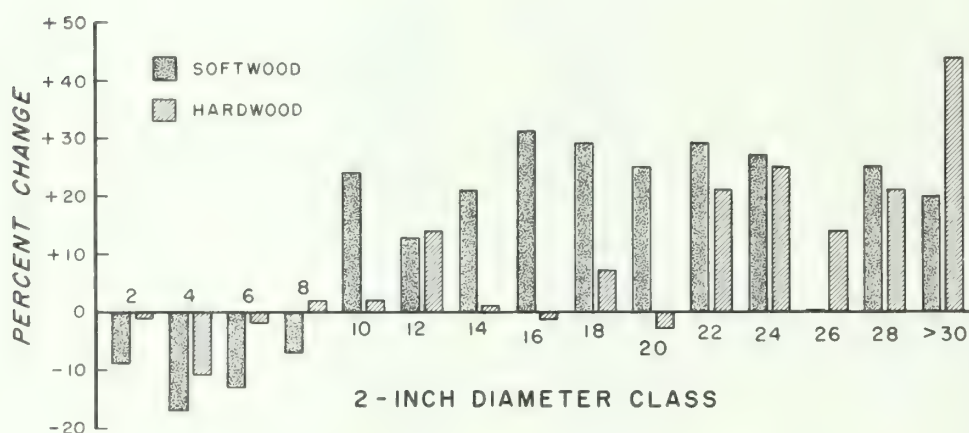


Figure 33.—Percent change in number of live trees per acre between 1974 and 1984 Louisiana surveys.

State-wide level, lack of regeneration after cutting can also cause significant decreases in the number of small trees.

Basal Area

Basal area of all live trees by diameter class for the State and individual units is illustrated in figures 34a-34f. The small amount of basal area in the larger stems is obvious. At the State level, only 29 percent of the basal area is in trees in the 16-inch diameter class and larger. Although having recovered substantially from an all-time low inventory in the late 1920's and early 1930's, Louisiana's forest as a whole is still in a cutover condition. Currently, the forests in the State are not properly balanced to provide a sustained yield of larger dimension timber. An intensively managed forest should carry much more basal area in the larger diameter classes to provide a sustained supply of suitable merchantable products. Recommended

basal areas are in the range of 4 to 8, 6 to 10, 6 to 11, 7 to 12, and 8 to 12 square feet per acre for the 16-, 18-, 20-, 22-, and 24-inch diameter classes, respectively (Putnam et al. 1960, Meyer 1952, Eyre and Zillgitt 1953, Gilbert and Jenson 1958). Although Louisiana's forest has a fairly adequate stocking level of 90 square feet per acre, 50 percent of this is in the 10-inch diameter class and smaller.

Unit trends are similar to that at the State level. The exception is the South Delta unit (117 square feet of basal area per acre). Here, a large proportion of basal area is in the mid-diameter ranges as these stands continue to recover from the heavy cutting that occurred up through the 1930's. Even today, these stands show signs of disturbance evidenced by a high proportion of basal area in the smaller diameter classes coupled with the relatively low basal area per acre for the entire unit. Other studies suggest that the cypress-tupelo type should be much higher in basal area (Ewel and Odum 1984).

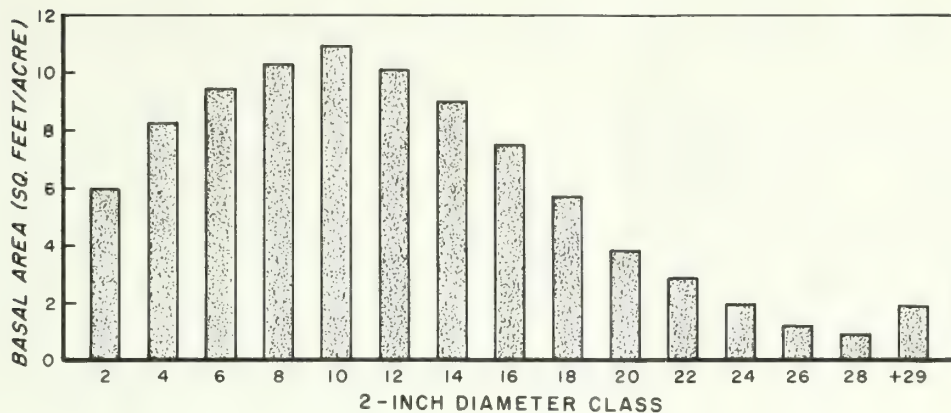


Figure 34a.—Basal area of all live trees by diameter class, Louisiana, 1984.

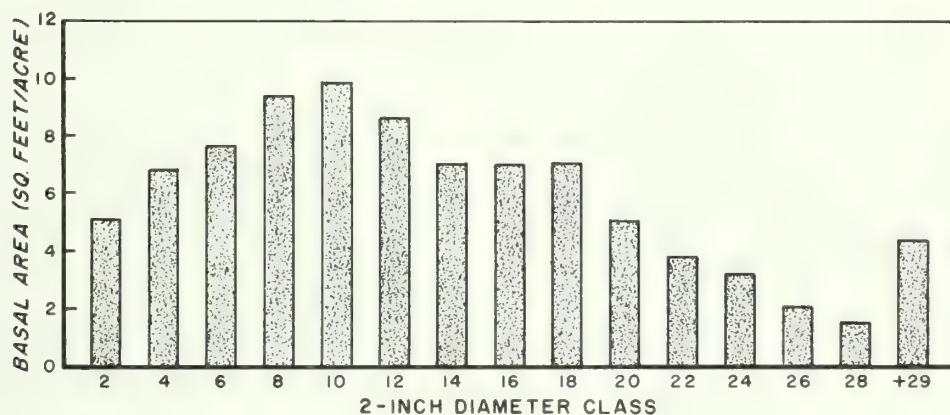


Figure 34b.—Basal area of all live trees by diameter class, North Delta unit, Louisiana, 1984.

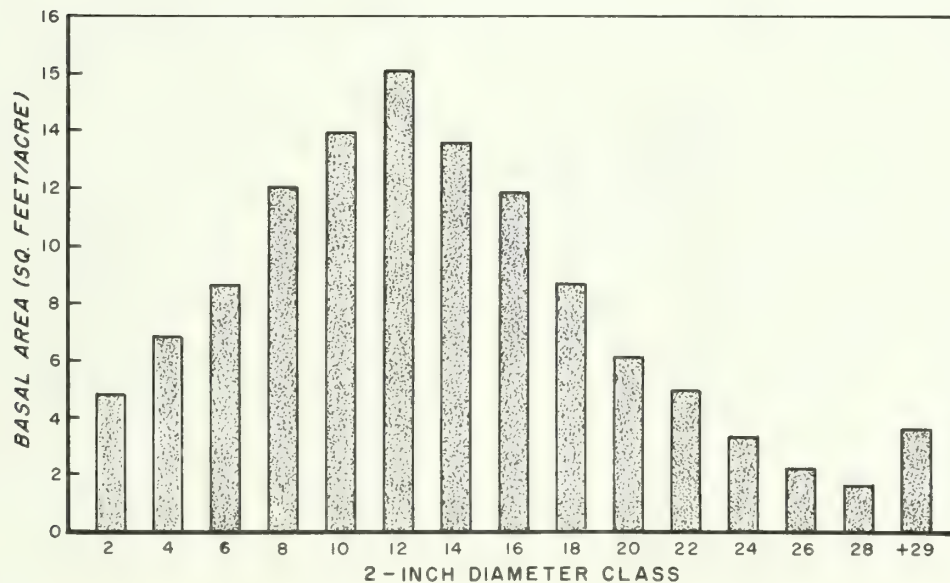


Figure 34c.—Basal area of all live trees by diameter class, South Delta unit, Louisiana, 1984.

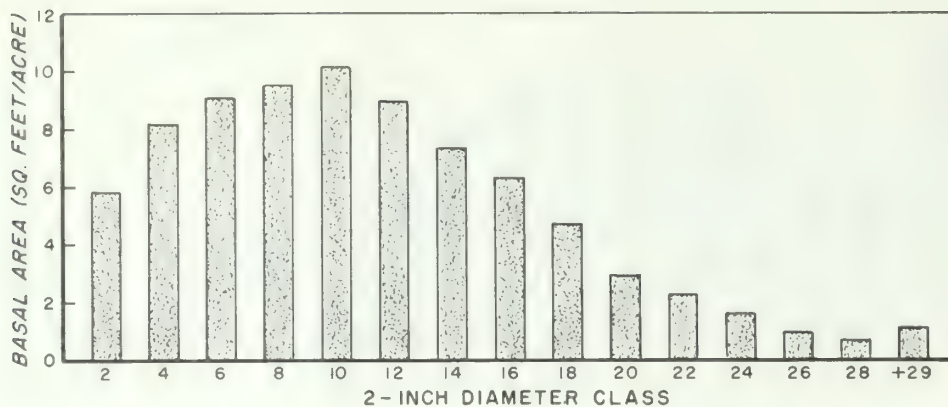


Figure 34d.—Basal area of all live trees by diameter class, Southwest unit, Louisiana, 1984.

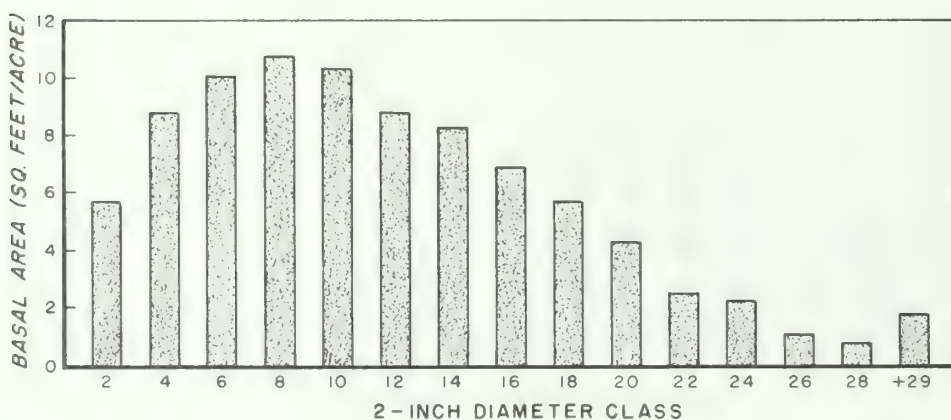


Figure 34e.—Basal area of all live trees by diameter class, Southeast unit, Louisiana, 1984.

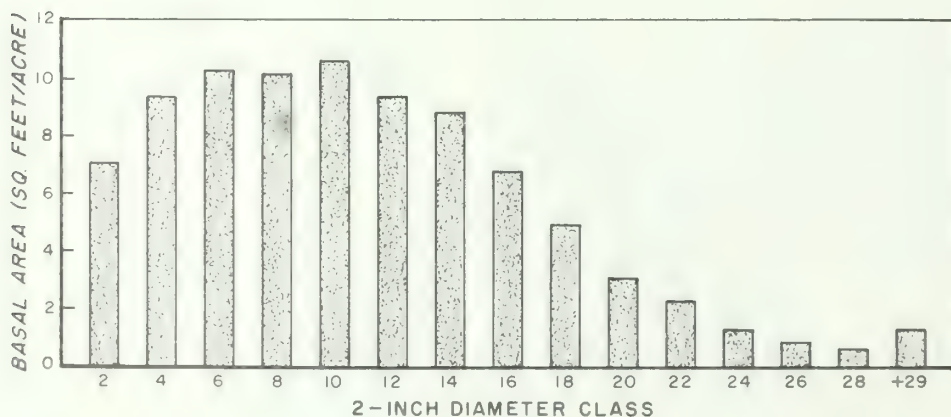


Figure 34f.—Basal area of all live trees by diameter class, Northwest unit, Louisiana, 1984.

GROWTH, REMOVALS, AND MORTALITY

Growth can be visualized in two ways: (1) growth of an individual tree or the mean growth of a collection of individual trees, and (2) growth of an entire stand of trees. Growth of an individual tree is fairly straightforward. It is reflected by the increase in bole diameter and increase in bole length, both of which are dependent on the biotic and abiotic environment of the tree. Stand growth is more complex in that it deals not only with increases in bole diameter and bole length but also with changes in tree population structure and timberland acreage fluctuations. That is, stand growth includes the realm of tree population dynamics. Additions to the tree population occur through regeneration and when individual trees reach and surpass an arbitrarily defined minimum dimension threshold. In addition, timberland acreage will increase when nonforest land reverts to forest, thus bringing established trees into the tree population. Likewise, the tree population can be reduced by the mortality of individual trees, either through disease, insect, injury, stress, and age or through the cultural practice of cutting trees. In addition, the tree population is reduced by conversion of timberland to agriculture, urban, or other nonforest uses; this plays a significant role by reducing the amount of acreage in which trees can grow.

Growth reported in FIA publications always implies stand growth, using volume (cubic feet or board feet) as the unit of measure. Stand growth is the periodic annual increment rather than current, average, or mean annual increment. Periodic annual increment is the measure of increase in merchantable volume of growing-stock trees divided by the number of years in the survey period. Trees are susceptible to mortality because of suppression (competition) in the earlier stages of stand development and because of natural or cultural causes (cutting) as stands approach maturity. Thus, growth of a timber stand cannot be measured by assuming all trees alive now will survive. Rather, it is the net increase in stand volume after natural losses are deducted. Gross growth may be useful as a measure of site potential and for use as a guide in minimizing losses due to insect and disease.

An improvement in the procedure for computing growth and removals has been implemented for the current Louisiana survey. In effect, this eliminates the "imbalance" problem at the State level ("imbalance" refers to the volume of the initial inventory plus computed net growth for the period, not equaling the volume of the second inventory). However, as the data are broken into smaller and smaller subsets, the increase in sampling error will mask the balance. The change in method of computing growth and removals is significant and may affect the validity of comparing these estimates with those of previous survey periods.

Some confusion surrounds the question of "imbalance" when computing growth estimates from horizontal point sampling data. In previous surveys, net growth was always calculated on trees from the past inventory and, when added to the past inventory volume, the sum did not always equal the new inventory volume. There were several reasons for this. First, growth was computed on survivor trees (see Appendix for definitions of growth component trees) of the first inventory. Second, ingrowth was then added to computed growth to give gross growth. Third, volume for the second inventory was based upon trees tallied at the second inventory which included new, nongrowth trees not included in the growth computations of the first survey. In essence, this was an entirely new sample and was not comparable with the first survey. Just as one would not expect two sets of fixed plots to be equal in volume, a prism point sampled at two different times will not be equal. With prism sampling, even though the sample point is the same, time changes the plot "size" because of the addition of nongrowth trees. In fixed plot sampling, time brings change only through ingrowth (regeneration) and growth on survivors because the plot boundary does not change (Husch et al. 1982). Therefore, because nongrowth trees were not used in computing growth, one would not expect the computation of growth plus the volume of the first survey to equal the volume of a new sample.

To solve this problem for the current Louisiana survey, ongrowth and nongrowth trees were included in the growth calculations. In the past, the survivor and ingrowth component of growth came from the time 1 portion of the sample. Currently, ongrowth and nongrowth trees, from time 2, are also included in the growth component. Ongoing trees, trees that were submerchantable and out (on the 37.5 basal area factor prism) at time 1 but merchantable and in (on the 37.5 basal area factor prism) at time 2, are part of the ingrowth component. Nongrowth trees, trees that are merchantable and out at time 1 but merchantable and in at time 2, are included in the survivor growth component (Van Deusen et al 1986).

Six components are used to compute growth: (1) growth on survivors—the growth on growing-stock trees present in the initial inventory that survive to the end of the inventory period, plus nongrowth trees; (2) ingrowth—the volume of trees that attain growing-stock size (5.0 inches in diameter) during the inventory period, plus ongrowth trees; (3) growth on cut—the growth on growing-stock trees that were cut (harvested) before the end of the inventory period; (4) growth on mortality—the growth on growing-stock trees that died before the end of the inventory period, from the first inventory up to the time of death; (5) mortality—the net volume of trees that have died before the end of the inventory period; (6) cull increment—a measure of trees going from an acceptable class at time 1 to a

rough or rotten class at time 2 (table XVI and table XVII). Trees may also pass from the rough or rotten class to the acceptable class, though rarely. In that instance cull increment would be an addition to growth for the inventory period. This condition usually results from a smaller tree being classed rough or rotten during the initial inventory due to the relative percentage of cull defect. Then, through growth and containment of the defect, the percentage of cull is reduced to an acceptable level in relation to the total tree.

To obtain removal estimates, prior Louisiana surveys used information from an industry canvass of timber received or produced, and from records of severance taxes paid on timber products removed. This information came solely from the calendar year prior to the field work of the survey. Currently, the removals estimates are derived entirely from field survey data, the same as growth and mortality information. Growth, removal, and mortality estimates are now all periodic averages and statistically compatible.

There are three growth classes commonly reported by FIA: (1) gross growth—the total growth in volume for the survey period. This includes growth on mortality trees up until their time of death; (2) net growth—gross growth minus mortality; and (3) net

change—net growth minus removals. Net change is real change in stand conditions and may be positive when net growth exceeds removals, or negative when removals exceeds net growth.

Softwood Growth

Gross growth of softwood growing stock in the 10 years since the 1974 survey has been 600 million cubic feet annually, 43.2 cubic feet per acre (table XVIII). This is a statistically significant decline from the 644 million cubic feet or 44.3 cubic feet per acre reported for the survey period between 1964 and 1974. Growth comparisons between surveys in this and subsequent sections are judged statistically significant or insignificant on the basis of the periodic annual estimate, not the per-acre estimate. On an annual basis, gross growth of softwood sawtimber for the current survey period is 2,850 million board feet, or 205.4 board feet per acre (table XIX). This is a nonsignificant change from the 2,787 million board feet (191.9 board feet per acre) reported in the preceding survey.

Softwood growing-stock net growth since the 1974 survey has been 545 million cubic feet annually, or 39.3 cubic feet per acre. This compares to 604 million cubic

Table XVI.—Components of annual change in the volume of growing stock by species group and forest survey units, Louisiana, 1974-1984¹

Forest survey units	Species group	Growth component								Net change
		Survivor growth ²	Ingrowth ³	Growth on removals	Growth on mortality	Cull increment	Mortality	Timberland removals	Land-clearing removals	
----- Million cubic feet -----										
North Delta	Softwood	9.7	1.4	2.9	0.2	0.5	-0.9	-11.0	-0.1	2.6
	Hardwood	40.0	2.6	2.6	1.0	-0.4	-8.3	-13.1	-22.9	1.5
	Total	49.7	4.0	5.5	1.2	0.1	-9.2	-24.2	-23.0	4.1
South Delta	Softwood	24.6	1.1	0.4	0.1	-1.4	-1.5	-3.3	-1.7	18.4
	Hardwood	85.9	6.3	1.9	3.9	-8.6	-27.9	-12.6	-10.8	38.0
	Total	110.5	7.4	2.3	4.1	-10.0	-29.4	-15.9	-12.5	56.4
Southwest	Softwood	172.5	21.2	41.9	4.3	-0.8	-20.4	-169.9	-6.2	42.6
	Hardwood	55.0	6.0	7.5	1.8	0.6	-10.8	-42.5	-6.8	10.8
	Total	227.5	27.2	49.4	6.1	-0.2	-31.2	-212.4	-12.9	53.4
Southeast	Softwood	61.4	7.2	8.7	1.2	-2.9	-6.8	-47.6	-6.1	15.1
	Hardwood	30.0	3.9	0.8	1.6	-3.3	-9.5	-6.8	-4.2	12.4
	Total	91.4	11.1	9.5	2.8	-6.3	-16.3	-54.4	-10.3	27.5
Northwest	Softwood	180.5	19.0	39.6	7.7	-0.7	-25.2	-172.8	-13.1	35.0
	Hardwood	103.2	9.5	9.4	2.6	4.5	-17.6	-51.2	-7.5	52.9
	Total	283.7	28.5	49.0	10.3	3.8	-42.8	-224.0	-20.6	87.9
All units	Softwood	448.6	49.8	93.4	13.5	-5.4	-54.6	-404.5	-27.1	113.7
	Hardwood	314.1	28.3	22.1	10.8	-7.1	-74.1	-126.1	-52.2	115.8
	Total	762.7	78.1	115.5	24.3	-12.5	-128.7	-530.6	-79.3	229.5

¹ Rows and columns may not sum due to rounding.

² Includes nongrowth trees.

³ Includes ongrowth trees.

Table XVII.—Components of annual change in the volume of sawtimber by species group and forest survey units, Louisiana, 1974-1984¹

Forest survey units	Species group	Growth component								Net change
		Survivor growth³	Ingrowth⁴	Growth on removals	Growth on mortality	Cull increment	Mortality	Timberland removals	Land-clearing removals	
----- Million board feet² -----										
North Delta	Softwood	40.8	13.3	10.0	0.0	2.9	0.0	-43.2	-0.3	23.6
	Hardwood	138.6	44.9	9.1	3.7	0.6	-30.5	-52.2	-73.1	41.2
	Total	179.4	58.3	19.1	3.7	3.5	-30.5	-95.4	-73.4	64.8
South Delta	Softwood	120.0	17.0	2.2	0.4	-4.5	-3.1	-15.7	-6.7	109.7
	Hardwood	244.0	116.8	6.8	11.0	-25.7	-73.3	-41.9	-30.9	206.8
	Total	364.0	133.8	9.1	11.4	-30.2	-76.4	-57.5	-37.6	316.5
Southwest	Softwood	615.1	290.1	161.1	14.7	-1.5	-66.3	-717.8	-23.8	271.6
	Hardwood	131.0	68.0	21.8	3.7	7.9	-27.5	-123.2	-17.8	64.0
	Total	746.1	358.1	182.9	18.4	6.4	-93.8	-841.0	-41.6	335.6
Southeast	Softwood	229.6	86.5	40.4	5.5	-11.2	-22.4	-214.7	-21.6	92.2
	Hardwood	72.7	40.1	2.9	2.7	-7.4	-23.2	-20.3	-13.7	53.7
	Total	302.3	126.6	43.2	8.2	-18.6	-45.6	-235.0	-35.3	145.9
Northwest	Softwood	727.1	274.2	192.7	21.8	1.5	-80.2	-803.8	-56.7	276.6
	Hardwood	241.6	106.5	33.3	7.8	16.0	-53.8	-160.7	-16.3	174.4
	Total	968.7	380.7	226.0	29.6	17.5	-134.0	-964.5	-73.0	451.0
All units	Softwood	1,732.6	681.1	406.4	42.4	-12.9	-171.9	-1,795.1	-109.1	773.5
	Hardwood	827.8	376.3	73.9	28.8	-8.5	-208.3	-398.2	-151.7	540.1
	Total	2,560.4	1,057.4	480.3	71.2	-21.4	-380.2	-2,193.3	-260.8	1,313.6

¹ Rows and columns may not sum due to rounding.² International ¼-inch rule.³ Includes nongrowth trees.⁴ Includes ongrowth trees.

Table XVIII.—Growing-stock growth in cubic feet per acre per year by growth classes and by softwood and hardwood, Louisiana, 1964-1974 and 1974-1984

Growth class	Softwood		Hardwood	
	1964-1974	1974-1984	1964-1974	1974-1984
----- Cubic feet -----				
Gross growth	44.3	43.2	27.1	26.5
Net growth	41.6	39.3	22.4	21.2
Net change	11.2	8.2	11.3	8.3

Table XIX.—Sawtimber growth in board feet per acre per year by growth classes and by softwood and hardwood, Louisiana, 1964-1974 and 1974-1984

Growth class	Softwood		Hardwood	
	1964-1974	1974-1984	1964-1974	1974-1984
----- Board feet ¹ -----				
Gross growth	191.9	205.4	95.1	93.6
Net growth	182.7	193.0	79.2	78.6
Net change	35.7	55.8	28.4	38.9

¹ International ¼-inch rule.

feet (a significant decline) or 41.6 cubic feet per acre, annually, for the 1964 to 1974 survey period. The net growth change for sawtimber volume was nonsignificant between the past and present survey periods, 2,654 million board feet versus 2,678 million board feet, 182.7 and 193.0 board feet per acre, respectively.

The comparison of net change between the past and present survey periods should especially be used with caution because of the different methods used to derive removal estimates. However, generalized trends should be valid. Currently, the periodic annual net change of softwood growing-stock volume is +114 million cubic feet per year, +8.2 cubic feet per acre. This is a 30-percent decline compared to data for net change from the survey period of 1964 to 1974. Net change, then, was a volume increase at a rate of 163 million cubic feet, 11.2 cubic feet per acre per year. Softwood sawtimber volume net change for the current survey period is increasing at a rate of 774 million board feet, 55.8 board feet per acre compared to 518 million board feet, 35.7 board feet per acre in the preceding survey period. The net change of sawtimber volume in softwoods has increased 49 percent over that of the previous survey period.

Highest gross growth rates for softwood growing stock are in the Northwest and Southwest units at 55.9 and 54.1 cubic feet per acre, respectively (table XX). These two units also have the highest net growth in the State. However, highest increases of net change are in the Southwest and Southeast units with 9.6 and 8.6 cubic feet per acre, respectively. The high rate of removals has dropped the Northwest unit to third in the State ranking in net change.

Hardwood Growth

Gross growth for hardwood growing stock is currently 368 million cubic feet per year, 26.5 cubic feet per acre per year, for the State (table XVIII). This is a significant decline from the 394 million cubic feet per year, 27.1 cubic feet per acre, reported in 1974.

Sawtimber gross growth also declined significantly from 1,382 million board feet in 1974 to 1,298 million board feet, currently. On a per-acre basis, that represents a drop from 95.1 board feet per acre per year to 93.6 board feet per acre per year between 1974 and 1984 (table XIX).

Hardwood growing-stock net growth has also declined slightly from 22.4 cubic feet per acre per year in 1974 to 21.2 cubic feet per acre per year currently (table XVIII). This is a significant decline from 325 million cubic feet per year in 1974 to 294 million cubic feet per year in 1984. Sawtimber net growth also declined slightly from 79.2 board feet per acre per year to 78.6 board feet per acre per year (table XIX). Total board foot net growth fell from 1,150 million board feet in 1974 to 1,090 million board feet in 1984, a significant change.

Hardwood growing-stock net change also decreased, from 11.3 cubic feet per acre in 1974 to 8.3 cubic feet per acre in 1984 (table XVIII). This is a total volume drop from 164 million cubic feet per year to 116 million cubic feet per year at the present time. However, sawtimber net change increased between survey periods from 28.4 board feet per acre per year to 38.9 board feet per acre per year (table XIX). This is a total volume change from 412 million board feet per year in 1974 to 540 million board feet in 1984, a 31 percent increase.

Highest gross growth in the State is in the North Delta unit at 50.1 cubic feet per acre per year (table XXI). Next are the South Delta and Northwest units at 37.4 and 29.4 cubic feet per acre per year. The North Delta unit is also highest in net growth, followed by the South Delta and Northwest units, all at 41.1, 25.7, and 25.4 cubic feet per acre, respectively. However, because of high rates of land clearings and removals, the North Delta unit drops to last in the State in the volume net change category. The net change is an addition in volume of only 1.6 cubic feet per acre per year. The South Delta and Northwest units are greatest with net changes of 15.9 and 12.0 cubic feet per acre per year, respectively.

Table XX.—Softwood growing-stock growth in cubic feet per acre per year ranked in descending order by forest survey units for gross growth, net growth, and net change, Louisiana, 1974-1984

Gross growth		Net growth		Net change	
Unit	Cubic feet per acre	Unit	Cubic feet per acre	Unit	Cubic feet per acre
Northwest	55.9	Northwest	50.2	Southwest	9.6
Southwest	54.1	Southwest	49.5	Southeast	8.6
Southeast	43.2	Southeast	39.3	Northwest	7.9
North Delta	16.1	North Delta	15.1	South Delta	7.7
South Delta	10.4	South Delta	9.7	North Delta	3.0

Table XXI.— *Hardwood growing-stock growth in cubic feet per acre per year ranked in descending order by forest survey units for gross growth, net growth, and net change, Louisiana, 1974-1984*

Gross growth		Net growth		Net change	
Unit	Cubic feet per acre	Unit	Cubic feet per acre	Unit	Cubic feet per acre
North Delta	50.1	North Delta	41.1	South Delta	15.9
South Delta	37.4	South Delta	25.7	Northwest	12.0
Northwest	29.4	Northwest	25.4	Southeast	7.1
Southeast	18.8	Southwest	13.6	Southwest	2.5
Southwest	16.1	Southeast	13.4	North Delta	1.6

Growing-Stock Removals

Between 1974 and 1984, 610 million cubic feet of softwood and hardwood growing-stock volume were removed per year in Louisiana. Of this, 531 million cubic feet were removed by harvesting and 79 million cubic feet were removed by land-clearings. The Northwest and Southwest units, by far, had the highest amounts of harvesting removals at 224 and 212 million cubic feet per year, respectively. Eighty-two percent of the State's growing-stock harvesting was within these two units. The highest amounts of land-clearing removals were in the North Delta unit, 23 million cubic feet per year, followed by the Northwest unit at 21 million cubic feet per year.

Most of the harvesting in the State was softwoods, 76 percent. In land-clearing removals, 66 percent were hardwoods.

Fifty-two percent of softwood growing-stock removals were from nonindustrial private lands while 40 percent came from forest industry lands. Only 8 percent came from public lands. Hardwood removals were even higher on nonindustrial private lands, 63 percent, with 31 percent coming from forest industry lands. Six percent of hardwood removals were from public lands.

Of the 432 million cubic feet of annual softwood removals in the State, only 1 percent was baldcypress, the remainder was in the southern yellow pines. Currently, only one mill is handling cypress timber in the State. Forty-seven percent of the annual 178 million cubic feet of hardwood removals were in the oak genus and 20 percent were in sweetgum.

Sawtimber Removals

More than 2,454 million board feet of softwood and hardwood sawtimber were removed per year from Louisiana timberlands between 1974 and 1984. Of this, 2,193 million board feet were removed by harvesting and 261 million board feet by land-clearing. Again, the

Northwest and Southwest units had the highest amounts of removals in the State, 964 and 841 million board feet per year, respectively. The highest amounts of sawtimber removed by land-clearing were in the North Delta and Northwest units, each at 73 million board feet per year. Over one-half of the State's land-clearing sawtimber removals were in these two units.

Eighty-two percent of the sawtimber harvesting removals were softwoods, while 58 percent of the sawtimber land-clearing removals were hardwoods.

Forty-nine percent of softwood sawtimber removals were from nonindustrial private lands, 42 percent from forest industry lands, and 9 percent from public lands. In hardwood sawtimber removals, nonindustrial private lands had an even larger contribution with 61 percent of the State's saw-log volume coming from such lands. Only 33 percent of sawtimber volume came from forest industry lands and 6 percent from public lands.

All of the softwood sawtimber removals were from the southern yellow pines except for 1 percent from baldcypress. The oak genus comprised 47 percent of hardwood sawtimber removals and sweetgum 20 percent. The remaining sawtimber removals were dispersed among several species of which only the hickories comprised a substantial amount, 9 percent, of the State's hardwood removals.

Growth-to-Removal Ratio

The growth-to-removal ratio is an indicator of the balance between growth and removals. Theoretically, as the ratio approaches 1.00 the probability of local shortages of specific forest resources becomes higher, because it is highly unlikely that the remaining depleted forest resource is evenly distributed throughout the given area in question at any specific time.

Growing stock growth-to-removal ratios for the State during the 1974 to 1984 survey period have been greatest on other public land (1.96), followed by nonin-

dustrial private land (1.58), and National forest land (1.35); the lowest ratio was on forest industry land (1.04). for sawtimber, respective ratios are 2.23, 1.87, 1.61, and 1.05.

Regionally, growing stock growth-to-removal ratios were highest in the South Delta unit (2.99). The lowest ratio was in the North Delta unit where a shrinking timberland base caused by land-clearings, along with substantial harvest removal, has lowered the ratio to 1.09. The Southeast, Northwest, and Southwest units were fairly similar in their growth-to-removal ratios of 1.43, 1.36, and 1.25, respectively.

Sawtimber ratios were also highest in the South Delta unit (4.33). The North Delta and Southwest units had the lowest ratios, both 1.38. The Southeast and Northwest units had growth-to-removal ratios of 1.54 and 1.43, respectively.

Mortality

Between 1974 and 1984, Louisiana lost 129 million cubic feet per year of growing stock to mortality, an increase of 18 percent over the previous survey period. Fifty-eight percent of this volume is in hardwood trees. However, most of the increase in mortality over the previous survey can be attributed to softwoods. Softwood mortality increased from 40 million to 55 million cubic feet per year, a 38 percent increase whereas hardwood mortality only increased 7 percent, from 69 million cubic feet per year to 74 million cubic feet per year.

The greatest incidence of mortality is in the South Delta unit at 12.3 cubic feet per acre per year. The North Delta unit is next highest at 10.1 cubic feet per acre per year followed by the Northwest, Southeast, and Southwest units at 9.7, 9.3, and 7.1 cubic feet per acre per year, respectively.

The annual mortality of sawtimber trees has been 380 million board feet, only a 4 percent increase. All of this increase over the last survey period can be attributed to softwood sawtimber mortality which rose 29 percent. Hardwood sawtimber mortality decreased to 10 percent.

While many agents cause mortality, the major categories are insects, disease, fire, and weather. These are especially significant on older trees, mostly larger pole-size and saw-log size trees. On younger trees, suppression is the major causal agent of mortality, especially when initial densities of newly established stands are high.

When the field work for the Louisiana survey was initiated the Southern Pine Beetle infestations were not significant in the State. Therefore, no special assessment was made of the impact of this agent on the resource by survey field crews. Statewide, the losses would be a small portion of the total volume. However, the impact locally could be significant due to the clumping nature of Southern Pine Beetle outbreaks.

TIMBER MANAGEMENT OPPORTUNITIES

Forest Productivity

The average acre of timberland in Louisiana has the potential for growing 114 cubic feet of growing-stock volume per acre per year (table XXII). This estimate is based on site class, which represents potential growth for fully-stocked natural stands at the culmination of mean annual increment of species appropriate to the site. The current estimate of potential productivity represents an apparent 23 percent increase over potential productivity in 1974. Potential productivity may appear to fluctuate between surveys

Table XXII.—Periodic annual gross growth and potential productivity¹ of timberland by forest survey units, Louisiana, 1974-1984

Forest survey units	Gross growth	Potential productivity	Gross growth as proportion of potential
	----- Cubic feet/acre/year -----		Percent
North Delta	66	141	47
South Delta	48	94	51
Southwest	70	114	61
Southeast	62	114	54
Northwest	85	120	71
All units	70	114	61

¹ Based on site class.

new site trees are bored at each remeasurement. Depending on the situation, trees that are superior or inferior to trees of the previous survey may cause change in the potential productivity of the site. Gross growth of growing stock averaged 70 cubic feet per acre per year or 61 percent of potential growth. Growth as percent of potential was highest in the Northwest unit (71 percent) and lowest in the North Delta unit (51 percent).

Current Forest Conditions

Stocking characteristics of Louisiana's timberland have changed somewhat since the previous inventory. Increases took place in both the area of severely-overstocked (greater than 130 percent) and understocked (less than 60 percent) stands. Decreases occurred in the moderately-overstocked (100 to 130 percent) and optimally stocked (60 to 100 percent) categories (fig. 35). Statewide, the area of severely-overstocked timberland nearly doubled. Two-thirds of the increase in these stands occurred in pine types. Understocked stands increased by 24 percent and now occupy 1,047,500 acres. Most of the increase in understocked stands occurred in the oak-hickory type. Such stands commonly result when oak-pine stands undergo pine-selection cuts and subsequently are converted to the oak-hickory type. Over one-half of the understocked acreage is classified as bottomland hardwoods.

Another change related to stocking occurred in cull stands (60 percent or more stocked with rough and rotten trees). The area of cull stands nearly tripled, increasing from 518,100 to 1,415,100 acres between 1974 and 1984.

Site occupancy, expressed as basal area per acre of all live trees, increased at the state level since 1974 (table XXIII). However, examination of changes in basal area by tree class shows that an increase has occurred in the occupancy of rough and rotten trees at the expense of growing-stock trees. This trend is most apparent for hardwoods in the bottomland hardwood and loblolly-shortleaf forest types. At the survey unit level, the occupancy of growing-stock trees has increased in the North Delta, South Delta, and Southeast units. The occupancy of rough and rotten trees increased in all survey units but is most pronounced in the South Delta and Southeast units.

Pine Stands

Currently, 8,680,100 acres are classified as capable of supporting pine timber. The area of pine sites declined only slightly since 1974 (by 1 percent). The area of pine site timberland supporting oak-pine and oak-hickory stands shows no significant change since 1974 and is presently 43 percent of the total. The opportunity still exists for conversion of such stands to pure pine.

There has been a trend toward more intensive pine management, particularly pine plantations establishment, over the past decade. Planting records document a steady increase in plantations, especially on forest industry land (fig. 36). Pine plantations total 1,470,800 acres, an increase of 5 percent. Most of the increase resulted from planting of loblolly pine. The area of plantations in the longleaf-slash forest type decreased since the previous survey.

An additional 494,100 acres of plantations are classified as oak-pine, oak-hickory, and bottomland-

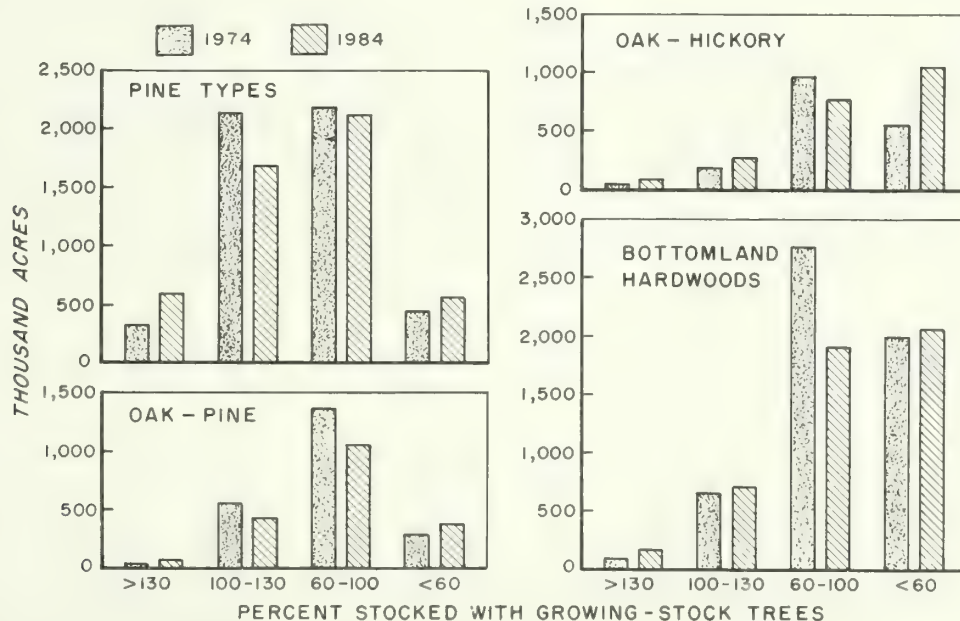


Figure 35.—Area of timberland by forest type and stocking class, Louisiana, 1974 and 1984.

Table XXIII.—Average basal area per acre of live trees by forest type and survey units, Louisiana, 1974 and 1984

Species group and forest type	Tree class 1984				Tree class 1974				Tree class 1984				Tree class 1974			
	All trees	Growing stock	Rough & rotten	All trees	All trees	Growing stock	Rough & rotten	All trees	All trees	Growing stock	Rough & rotten	All trees	All trees	Growing stock	Rough & rotten	All trees
..... Square feet per acre																
State of Louisiana																
Softwoods:																
Longleaf-slash	61.9	58.8	3.1	58.8	57.7	1.1	1.1	59.8	57.0	2.9	2.9	58.4	57.4	1.1	1.1	58.4
Loblolly-shortleaf	73.5	68.7	4.8	70.0	67.8	2.2	2.2	71.5	66.4	5.1	5.1	67.8	66.2	1.6	1.6	67.8
Oak-pine	33.8	31.7	2.1	32.6	31.6	1.0	1.0	34.8	32.9	1.9	1.9	32.8	32.1	0.7	0.7	32.8
Oak-hickory	7.8	7.2	0.6	9.6	9.2	0.4	0.4	7.6	7.0	0.6	0.6	9.6	9.4	0.2	0.2	9.6
Bottomland hardwoods ¹	16.3	13.9	2.4	13.0	11.2	1.8	1.8	7.3	6.6	0.7	0.7	8.7	7.3	1.3	1.3	8.7
All softwoods	37.0	34.2	2.8	34.7	33.2	1.6	1.6	43.1	40.3	2.8	2.8	42.2	41.1	1.1	1.1	42.2
Southwest																
Hardwoods:																
Longleaf-slash	4.5	2.0	2.4	5.2	2.8	2.4	2.4	4.0	1.7	2.2	2.2	4.6	2.5	2.2	2.2	4.6
Loblolly-shortleaf	23.0	13.1	10.0	23.7	16.0	7.7	7.7	20.0	10.9	9.1	9.1	23.7	15.2	8.5	8.5	23.7
Oak-pine	46.3	29.0	17.3	50.5	34.3	16.2	16.2	48.1	29.0	19.0	19.0	49.8	34.4	15.5	15.5	49.8
Oak-hickory	56.8	34.1	22.7	59.2	37.4	21.7	21.7	50.9	30.0	20.8	20.8	59.0	38.7	20.2	20.2	59.0
Bottomland hardwoods ¹	89.2	55.4	33.8	84.8	56.4	28.4	28.4	79.4	48.0	31.4	31.4	83.8	51.6	32.2	32.2	83.8
All hardwoods	53.1	32.4	20.6	53.8	35.7	18.1	18.1	36.3	21.3	15.0	15.0	40.3	25.9	14.4	14.4	40.3
All types	90.1	66.6	23.4	88.5	68.9	19.7	19.7	79.4	61.6	17.8	17.8	82.5	67.0	15.5	15.5	82.5
North Delta																
Softwoods:																
Longleaf-slash	75.0	75.0	...	151.6	151.6	...	...	73.6	68.8	4.8	4.8	54.1	53.6	1.0	1.0	54.1
Loblolly-shortleaf	78.4	74.8	3.6	69.7	68.2	1.4	1.4	67.7	62.8	4.9	4.9	61.3	59.5	1.8	1.8	61.3
Oak-pine	34.6	32.0	2.5	31.9	31.9	...	...	33.9	30.2	3.7	3.7	29.0	28.1	0.9	0.9	29.0
Oak-hickory	8.7	8.5	0.2	9.2	8.5	0.7	0.7	5.9	5.2	0.7	0.7	6.7	6.2	0.4	0.4	6.7
Bottomland hardwoods ¹	2.1	1.5	0.6	1.4	0.8	0.6	0.6	18.3	15.3	2.9	2.9	12.0	11.1	0.9	0.9	12.0
All softwoods	14.1	13.0	1.1	8.5	7.9	0.6	0.6	37.9	34.6	3.4	3.4	34.0	32.9	1.1	1.1	34.0
Southeast																
Hardwoods:																
Longleaf-slash	19.4	17.6	1.8	12.6	12.6	...	...	5.2	2.2	2.9	2.9	6.3	3.2	3.1	3.1	6.3
Loblolly-shortleaf	24.0	16.6	7.4	20.0	10.5	9.5	9.5	21.3	10.7	10.6	10.6	18.0	11.6	6.4	6.4	18.0
Oak-pine	43.6	29.7	13.9	56.0	42.2	13.8	13.8	42.2	23.7	18.4	18.4	46.5	26.8	19.7	19.7	46.5
Oak-hickory	48.3	28.5	19.9	54.2	32.4	21.9	21.9	55.3	27.6	27.7	27.7	45.2	25.6	19.6	19.6	45.2
Bottomland hardwoods ¹	89.7	62.4	27.3	83.5	59.9	23.6	23.6	100.8	61.4	39.4	39.4	94.8	62.4	32.4	32.4	94.8
All hardwoods	74.8	51.6	23.1	76.5	54.6	22.0	22.0	50.0	28.1	21.8	21.8	45.1	28.3	16.8	16.8	45.1
All types	88.9	64.6	24.2	85.0	62.5	22.6	22.6	87.9	62.7	25.2	25.2	79.9	61.2	17.9	17.9	79.9

		South Delta					Northwest				
Softwoods:		...	...	...	...	...	...	...	...	...	...
Longleaf-slash	80.7	67.0	13.7	65.7	65.7	...	59.9	59.9	85.4	83.1	2.3
Loblolly-shortleaf	36.6	36.6	...	56.3	56.3	...	76.4	72.2	74.5	71.6	2.9
Oak-pine	1.7	1.7	...	3.7	3.7	...	32.9	31.1	33.2	31.9	1.3
Oak-hickory	25.9	22.3	3.6	20.7	18.0	2.6	9.2	8.5	11.3	10.8	0.5
Bottomland hardwoods ¹							7.4	5.9	8.6	7.2	1.4
All softwoods		26.3	22.6	3.1	21.0	18.5	41.2	38.7	2.5	42.4	1.9
Hardwoods:		...	...	...	...	...	...	...	...	...	...
Longleaf-slash	43.0	29.5	13.6	19.1	14.1	...	17.5	10.2	7.3	9.3	3.2
Loblolly-shortleaf	42.7	9.9	32.8	97.1	87.8	9.3	25.4	15.0	10.5	25.7	7.4
Oak-pine	82.5	49.4	33.0	72.5	40.6	32.0	46.4	30.7	15.8	51.4	16.1
Oak-hickory	93.2	56.3	37.0	85.9	57.5	28.4	59.7	38.2	21.5	63.5	22.5
Bottomland hardwoods ¹							78.8	50.2	28.6	77.8	27.8
All hardwoods		91.1	55.0	36.2	84.4	56.3	45.8	28.9	16.9	47.3	15.6
All types		117.4	77.6	39.3	105.4	74.8	87.0	67.6	19.4	89.7	17.5

¹ Includes oak-gum-cypress and elm-ash-cottonwood forest types.

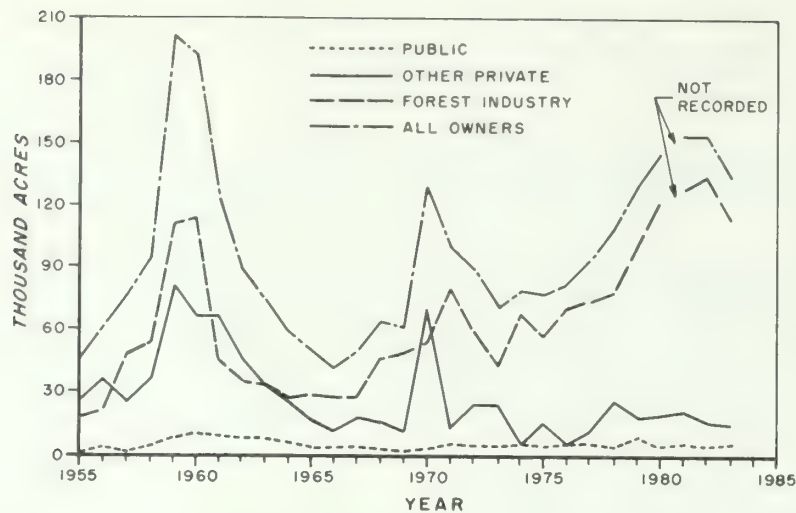


Figure 36.—Acres of forest planting in Louisiana, 1955-1983.

Table XXIV.—Area of timberland classified as plantations by ownership class and forest type, Louisiana, 1984¹

Ownership class	All types	Longleaf-slash	Loblolly-shortleaf	Oak-pine	Oak-hickory	Bottomland hardwoods ²
----- Thousand acres -----						
Public	97.4	33.8	45.3	12.1	6.2	...
Forest industry	1,008.8	198.9	505.9	141.7	135.1	27.2
Nonindustrial private	858.6	311.2	375.6	67.3	75.4	29.1
All ownerships	1,964.9	544.0	926.8	221.1	216.7	56.3

¹ Rows and columns may not sum due to rounding.

² Includes oak-gum-cypress and elm-ash-cottonwood forest types.

hardwood forest types. This is because the pine component contributes less than 25 percent of total stocking (table XXIV). Hardwood control in the upland stands represents an opportunity for increasing future softwood production.

Most of the acreage in pine forest types (58 percent) is in good condition and requires no treatment (table XXV). An opportunity for commercial harvest exists on 900,600 acres of the pine stands. This recommendation is made for sawtimber stands containing in excess of 5,000 board feet (International 1/4-inch rule) of merchantable volume per acre. The bulk of the acreage is in natural stands on nonindustrial private land. Another 415,100 acres are inadequately stocked with growing-stock trees and need regeneration. Growth on this acreage will be considerably below potential if the area is left unmanaged. Thinning of poletimber stands is an opportunity on 312,200 acres of pine type timberland.

Fifty-six percent of Louisiana's oak-pine forest could be left to grow without additional treatment. Opportunities in the remaining stands lie mostly in improving stand quality in terms of the level of stocking and corresponding competition from undesirable trees. Regeneration activity is suggested for 330,900 acres to boost stocking and improve subsequent growth. Stocking control other than thinning is recommended for 274,200 acres of oak-pine stands. Such stands are adequately stocked with growing-stock trees but require removal of vegetation inhibiting the growth of crop trees.

Hardwood Stands

Bottomland hardwoods are Louisiana's most prevalent hardwood forest type. Substantial opportunity exists for improvement of these forests as two-thirds of the bottomland hardwood area (3,189,100 acres)

Table XXV.—Area of timberland by forest class, ownership class, and treatment opportunity, Louisiana, 1984¹

Forest class and ownership classes	Stand Establishment			Intermediate treatments			Final harvest		
	Total	No treatment	Regenerate	Stand conversion ²	Thin seedlings and saplings	Thin poletimber	Other stocking control	Regeneration cut	Salvage cut
----- <i>Thousand acres</i> -----									
Pine plantation:									
Public	79.2	45.0	11.4	...	...	...	11.7	11.1	...
Forest industry	704.8	407.1	63.2	5.8	17.3	91.3	68.9	45.4	5.8
Nonindustrial private	686.9	396.8	50.9	5.5	17.4	52.4	28.3	118.2	17.4
Total	1,470.8	849.0	125.5	11.3	34.7	143.6	108.9	174.7	23.2
Natural pine:									
Public	395.0	277.4	35.4	...	...	...	11.2	71.0	...
Forest industry	986.8	548.4	57.9	...	11.4	88.9	79.3	177.0	23.9
Nonindustrial private	2,113.6	1,223.2	196.2	5.5	6.3	79.7	81.7	478.0	43.0
Total	3,495.7	2,049.1	289.6	5.5	17.8	168.6	172.2	726.0	66.9
Oak-pine:									
Public	160.3	107.0	11.2	...	...	...	12.0	24.6	5.5
Forest industry	635.5	377.4	88.1	...	5.6	17.6	106.5	15.3	25.0
Nonindustrial private	1,117.5	589.8	231.7	...	11.4	17.6	155.7	72.8	38.5
Total	1,913.4	1,074.2	330.9	...	17.0	35.3	274.2	112.7	69.1
Oak-hickory:									
Public	121.6	51.4	35.7	...	...	...	34.5	...	...
Forest industry	661.5	183.4	295.1	11.2	5.5	11.6	117.2	16.7	20.8
Nonindustrial private	1,387.5	447.2	587.0	30.1	...	48.0	158.1	17.3	99.8
Total	2,170.7	682.0	917.8	41.2	5.5	59.6	309.9	34.1	120.6
Bottomland hardwood:									
Public	574.5	167.0	242.2	...	...	5.5	22.2	22.6	115.0
Forest industry	614.3	231.0	185.3	16.9	...	14.2	10.9	34.0	122.0
Nonindustrial private	3,633.3	1,235.1	1,255.0	20.0	...	63.7	230.0	347.8	481.7
Total	4,822.3	1,633.2	1,682.6	36.9	...	83.4	263.1	404.4	718.7
All classes:									
Public	1,330.8	647.8	335.9	...	...	5.5	91.7	129.4	120.5
Forest industry	3,603.0	1,747.5	689.7	33.9	39.7	223.6	382.8	288.3	197.5
Nonindustrial private	8,938.7	3,892.1	2,320.8	61.1	35.1	261.4	653.8	1,034.0	680.4
Total	13,872.5	6,287.4	3,346.3	94.9	74.9	490.5	1,128.3	1,451.8	998.4

¹ Rows and columns may not sum due to rounding.² Stands containing considerable stocking of damaged or diseased trees but with insufficient merchantable volume to warrant a salvage cut.

needs some form of treatment. Over one-half of the area recommended for treatment (1,682,600 acres) needs regeneration work due to inadequate stocking of growing-stock trees. An additional 718,700 acres are characterized by excessive damage to the merchantable stand. Salvable dead volume should be removed in these stands and regeneration should be undertaken to restore the stand's future merchantability. The decision to invest in bottomland hardwood stands should be tempered by consideration of treatment costs. Roughly one-fourth of the bottomland hardwood stands recommended for treatment are more than a mile from an all-weather road. Additional constraints exist that are related to operability in poorly-drained stands.

Louisiana's oak-hickory forest is often neglected due to higher priorities set for pine management. Much of the existing oak-hickory stands originated as oak-pine stands that were selectively logged for pine. In addition, pure pine stands that were not regenerated after harvesting became oak-hickory stands. More than two-thirds of Louisiana's oak-hickory stands would require some form of treatment to attain full vigor. Sixty-two percent of the area needing treatment requires regeneration (917,800 acres). Twenty-one percent is in need of stocking control to concentrate production on crop trees.

Management Activity

Since 1974, 2,853,800 acres of Louisiana timberland have shown evidence of some form of forest management. Three major areas were assessed by forest survey field crews: thinning, stand improvement, and site preparation. Most of the activity, 48 percent, involved some aspect of stand improvement. Only 903,900 acres showed signs of site preparation (table XXVI). This is a conservative estimate because field crews may have been sampling a clearcut area before site preparation activity commenced. However, there will, in all likelihood, be a slight shift from intensive site preparation techniques to natural stand regeneration in the future because of the increasing costs of the former. It appears that many companies are also find-

ing it difficult to keep artificial stand establishment in pace with cutting.

The survey shows that 11,018,900 acres of timberland had no signs of management activity since 1974. As one would expect, nonindustrial private landowners showed least activity, 85 percent of their timberland was not involved in management activity. Public timberland was next with 79 percent showing no activity. Forest industry had 65 percent of its timberland showing no form of activity. Thirty-five percent of forestry industry timberland did have signs of management activity; site preparation and stand improvement accounted for 81 percent.

Clearly an opportunity exists for forest management on nonindustrial private timberlands in Louisiana. Most of this activity should be in the form of site preparation and regeneration on cutover timberland, in stand improvement on established stands with growing-stock trees, and finally in thinning operations on timberland that has been cut and replanted. All too often on private lands, once stand establishment has taken place, forest stands are left to stagnate and go through natural suppression cycles until harvest. Thinning speeds the succession process and is an important follow-up in a sound management plan. According to the stocking levels reported by the survey, 1,606,000 acres of overstocked poletimber stands need thinning.

Tract Size

Size of timberland may be important to management in terms of economic feasibility. The size of equipment, distance this equipment has to be moved, cost of labor, etc. all impact on management from regeneration to harvest. Small tracts require too much down time in relocating equipment between areas of operation.

Louisiana has 898,200 acres of timberland that could be considered nonoperable because of small tract size (100 acres or less) (table XXVII). Most of this acreage is in the bottomland hardwood forest types (386,500 acres), but a sizeable amount is also in the loblolly-shortleaf forest type (227,500 acres). Much of

Table XXVI.—Area of timberland by management activity and ownership class, Louisiana, 1984¹

Ownership class	Management activity				
	All classes	None	Thinning operation	Stand improvement	Site preparation
----- Thousand acres -----					
Public	1,330.8	1,054.0	48.0	188.1	40.7
Forest industry	3,603.1	2,335.4	240.8	497.4	529.5
Nonindustrial private	8,938.8	7,629.5	304.3	671.3	333.7
All ownerships	13,872.7	11,018.9	593.1	1,356.8	903.9

¹ Rows and columns may not sum due to rounding.

Table XXVII.—Area of timberland by forest type and size of forest tract, Louisiana, 1984¹

Forest type	Size of forest tract (acres)							
	All classes	1-10	11-50	51-100	101-500	501-2,500	2,501-5,000	More than 5,000
----- Thousand acres -----								
Longleaf-slash	933.2	...	12.1	12.4	71.2	376.4	195.7	265.4
Loblolly-shortleaf	4,033.2	34.3	109.4	83.8	661.3	1,642.9	887.8	613.8
Oak-pine	1,913.3	...	40.8	52.3	259.4	877.9	382.2	300.6
Oak-hickory	2,170.7	18.3	57.7	90.6	359.1	930.1	508.0	206.9
Oak-gum-cypress	4,377.6	58.7	125.8	146.9	542.4	1,141.0	925.0	1,437.7
Elm-ash-cottonwood	412.4	13.8	30.2	11.1	71.0	58.4	58.2	169.6
All types ²	13,840.2	125.1	376.0	397.1	1,964.4	5,026.7	2,956.9	2,994.0

¹ Rows and columns may not sum due to rounding.² Does not include 32,400 acres of nontyped timberland.

this small-tract timberland might be harvested with systems that utilize smaller equipment or it could be taken out of timber management altogether and utilized as a wildlife and aesthetic resource.

Most of Louisiana's timberland, however, is in tracts of 500 acres or larger. A total of 10,977,600 acres of timberland consists of such tracts and 5,950,900 acres of this is in tracts 2,500 acres and larger. The majority of this acreage is of the oak-gum-cypress (2,362,700 acres) and loblolly-shortleaf forest types (1,501,600 acres). There is ample opportunity for varying degrees of management in these stands. Unfortunately, the data do not adequately explain ownership tract sizes. For example, 2,500 acres, even though contiguous, might be divided among 10 different owners. More attention needs to be given to this important area in future surveys in order to give a more complete meaning to the term tract size.

TIMBER PRODUCTS OUTPUT

Louisiana's forest industries generated 583 million cubic feet of roundwood for use in the manufacture of timber products in 1983 (table XXVIII). Softwood output gained in all of the major product classes, including pulpwood, saw logs, and veneer logs. Hardwood pulpwood output increased but saw and veneer log output declined substantially.

Pulpwood

Pulpwood continues to dominate Louisiana's timber products output, accounting for 48 percent of total production. Pulpwood output was 3,459 thousand cords in 1983, an increase of 7 percent since 1973. Louisiana ranked fourth (behind Georgia, Alabama, and

Mississippi) in total pulpwood production in the South in 1983 (Hutchins 1983). Softwoods represented 75 percent of the pulpwood harvest. Hardwood pulpwood output rose by 15 percent, reflecting increased demand for this product.

Pulpwood roundwood output is supplemented by residues generated by sawmills and other sources. Residues comprised 29 percent of the total pulpwood production from 1974 to 1983. Softwood roundwood output declined during the period, reaching a low of 2,027 thousand cords in 1977 and then increased to a high of 2,586 thousand cords in 1980 (fig. 37). Hardwood roundwood output remained relatively stable, averaging about 770 thousand cords per year.

Output of residues was erratic. Softwood increases occurred in the early part of the period, then declined. In 1983 a sharp increase took place. Hardwood residues remained somewhat stable until the period between 1979 and 1981 when they more than doubled. Subsequently, hardwood residues decreased to a level more consistent with the early part of the period.

Sawtimber

The last 10 years were an unstable period for the saw and veneer log industry in Louisiana (Louisiana Department of Natural Resources 1986). Fluctuations in sawtimber output were most severe for pine (fig. 38). Production climbed from 1,310 million board feet in 1975 to a high of 1,814 million board feet in 1977. Output of pine sawtimber plunged to a low of 1,239 million board feet in 1982, and then recovered in 1983 by increasing to roughly the average output level for the 10-year period.

Forest industries received 1,101 million board feet of saw logs from Louisiana's timberland in 1983. This amounted to a decrease of 6 percent compared to 1973.

Table XXVIII.—Total output of timber products by product and species, Louisiana, 1983

Product	Standard units	Volume in standard units			Volume in cubic feet		
		All species	Softwood ^a	Hardwood	All species	Softwood ^a	Hardwood
					----- Million cubic feet -----		
Saw logs ¹	Million board feet ²	1,100.5	828.4	272.1	186.7	140.2	46.5
Veneer logs ¹ and bolts	Million board feet ²	692.5	685.3	7.2	108.4	107.2	1.2
Pulpwood ³	Thousand cords	3,459.3	2,579.8	879.5	279.4	209.0	70.4
Posts, poles ¹ , and piling	Million board feet ²	50.3	50.3	...	8.1	8.1	...
All products					582.6	464.5	118.1

¹ Based on severance tax estimates.
² International 1/4-inch rule.
³ From Hutchins, 1985.
⁴ Includes cypress.

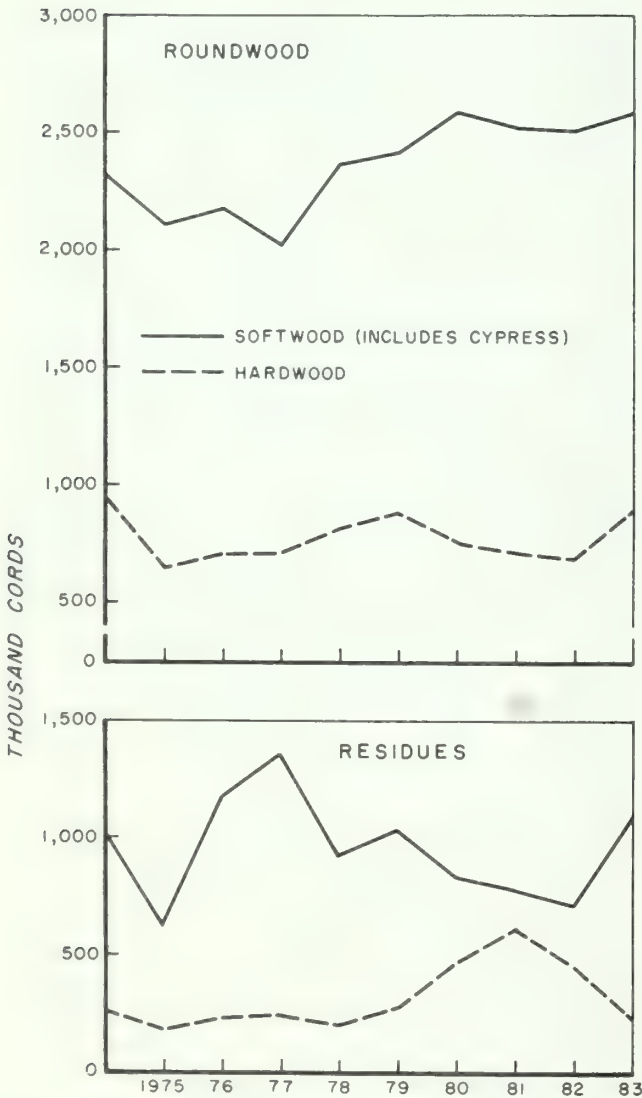


Figure 37.—Pulpwood production by roundwood and residues, softwood and hardwood, Louisiana, 1975-1983.

The softwood component of 828 million board feet represented three-fourths of the total and increased by 1 percent over 1973. The 1983 hardwood saw-log production of 272 million board feet, conversely, declined by 22 percent from 1973 levels.

Louisiana has 20 fewer sawmills than a decade ago (fig. 39). The decline in the number of sawmills is due primarily to two recessions in the wood products industry over the past decade. Additionally, buy-outs and company mergers caused consolidation of some facilities. The average annual production per mill is approaching 8 million board feet. Fifty-four of the 118 mills are classified as large sawmills producing over 3 million board feet annually. Twenty of these mills exceed 10 million board feet per year and account for approximately 50 percent of the total saw-log production.

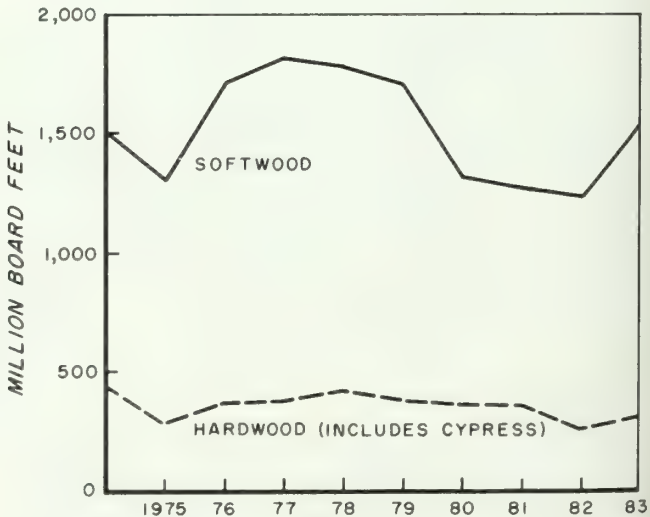


Figure 38.—Output of sawtimber products in Louisiana, 1974-1983.

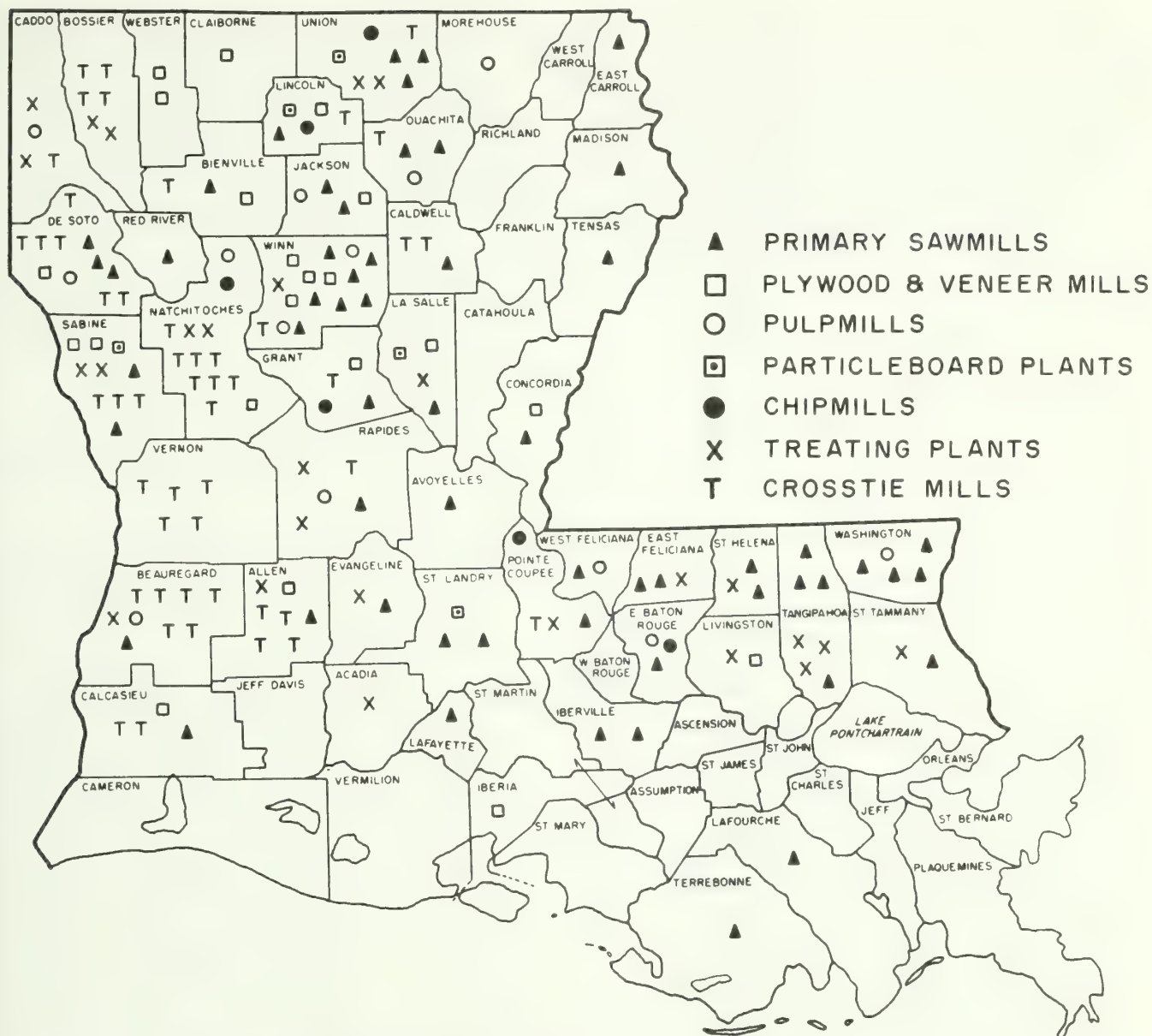


Figure 39.—Primary wood-using industries in Louisiana, 1983.

A total of 692 million board feet of veneer logs was received by Louisiana's 14 plywood and veneer mills in 1983, an increase of 8 percent. The preponderance of veneer production, 99 percent, was softwood. With the introduction of oriented-strand board, softwood veneer production may decline over the next 10 years. Since 1981, seven plywood and veneer mills have closed down. Hardwood veneer production has dropped by 52 percent since 1973. The 7 million board foot total represented an all time low for this product.

Output of posts, poles, and piling collectively totaled 50 million board feet, or 1 percent of the total product mix in 1983. All three products experienced declines over 1973 levels.

Fuelwood

The U.S. Department of Energy estimated that fuelwood consumption in Louisiana amounted to 2,258 thousand cords in 1981, with industrial consumption at 1,930 thousand cords and residential consumption at 328 thousand cords (U.S. Department of Energy 1982). A decade earlier, industrial consumption was 1,868 thousand cords, with residential consumption at 216 thousand cords. About two-thirds of the increase between 1971 and 1981 was due to an increase in consumption by residential users.

Recent industrial fuelwood production data are not available. Domestic fuelwood output was derived from a telephone survey of Louisiana households and com

mercial vendors for the 1983 to 84 heating season (Rudis 1986). Domestic fuelwood output amounted to 467 thousand cords. Of this amount, 45 percent came from live trees on timberland, with the remainder from logging residues, dead trees, and nontimberland areas. Most of the wood was oak, and was cut from nonindustrial private timberland. Production was greatest in the northern parishes near major cities. An estimated 140 thousand cords of fuelwood (10 million cubic feet) came from growing-stock trees.

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APPENDIX

Survey Methods

Forest resource statistics were obtained by a sampling method employing a forest-nonforest classification on aerial photography and on-the-ground measurements of trees at sample locations. Inventory volume and area statistics are required to give precise answers at the State level to 1 standard deviation of the total, equal to 1 percent per million acres of forest land and to 5 percent per billion cubic feet.

The estimate of timberland acreage is based on the photointerpretation of recent aerial photography using dot counts on specific plot locations as to a forest or nonforest classification. These dot counts yield the proportion of forest to nonforest areas in each parish. Forest area changes are then determined from field observation of permanent 3- by 3-mile grid (measurement plots) locations. Additional plots (intensification plots), for classifying points as to forest or nonforest condition only, are used to further reduce the sampling error for forest area. The field classifications of these two types of plots (3 by 3 and intensification) are used to correct photointerpretation errors and adjust the parish timberland acreage estimate that comes from the dot counts associated with each plot location in the parish. The intensity level of the 3- by 3-mile grid layout of permanent measurement plots gives each sample plot an expansion factor representing, on average, 5,760 acres per plot.

Volume estimates come entirely from the 3- by 3-mile grid permanent sample plots and measurements of individual trees on these plots. The plots established by the prior survey were remeasured to determine the elements of change. In Louisiana, five horizontal points were measured at each plot location. Trees 5.0 inches in diameter and larger were selected with a 37.5 factor prism, thus each tree selected with the prism represented 7.5 square feet of basal area. Trees smaller than 5.0 inches in diameter were tallied on a 1/275-acre circular plot fixed around the first 3 points of the 5-point cluster.

Forest survey uses a satellite point system with a large factor prism to get a representative sample of stand conditions at each plot location. This eliminates the effect that vegetation clumping and open gaps would induce if only one point or one fixed plot were used at each plot location.

Volumes in Louisiana were derived from fixed form diameter-squared times bole length regression equations. These equations were developed from deterministic measurements of trees on 8 percent of the field locations. The deterministic measurements include diameter at breast height, total height, bole length, log length, and four upper stem diameters. Volumes for these trees were computed using Smalian's formula. Equations were developed for seven species groups in Louisiana and these equations were used to estimate volumes on the remaining trees that did not have deterministic measurements made.

Reliability of the Data

A relative standard of accuracy has been incorporated into the forest survey. This satisfies user demands, eliminates as much as possible any elements of error—either human or from instrumentation—and permits the control of costs within prescribed economic limits.

The first type of error, estimating error, involves three basic areas: (1) biased error, caused by instruments not properly calibrated; (2) compensating error, caused by instruments of moderate precision; and (3) accidental error, caused by human error in measuring and compiling. All of these are held to a minimum by a system that incorporates training, check plots, and an edit (consistency) check. Field personnel undergo training for 3 to 4 months under the guidance of field-experienced personnel. Field work is checked by supervisors. In Louisiana 4 percent of the plots were field checked for errors. Editing checks in the office screen out logical and key punching errors on all plots. It is not possible to measure estimating error statistically

Table XXIX.—*Sampling errors for estimates of total timberland area, volume, periodic net annual growth (1974-1984), and periodic annual removals (1974-1984), Louisiana, 1984*

Item	Total	Unit	Percent sampling error
Timberland area	13,872.6	Thousand acres	0.3
Growing stock			
Volume	18,992.0	Million cubic feet	1.9
Periodic net annual growth	839.4	Million cubic feet	2.0
Periodic annual removals	610.0	Million cubic feet	2.6
Sawtimber			
Volume	70,735.2	Million board feet ¹	2.4
Periodic net annual growth	3,767.7	Million board feet ¹	2.1
Periodic annual removals	2,454.1	Million board feet ¹	3.1

¹ International ¼-inch rule.

Table XXX.—Sampling error to which estimates are liable, 2 chances out of 3, Louisiana, 1984

Sampling error ¹	Timberland area	Growing stock			Sawtimber		
		Volume	Periodic net annual growth	Periodic annual removals	Volume	Periodic net annual growth	Periodic annual removals
Percent	Thousands acres	----- Million cubic feet -----			----- Million board feet ² -----		
1.0	1,248.5	...	...	...	...	...	...
2.0	312.1	17,140.3	839.4	...	...	...	...
3.0	138.7	7,617.9	373.1	458.2	45,270.5	1,846.2	...
4.0	78.0	4,285.1	209.9	257.7	25,464.7	1,038.5	1,474.0
5.0	49.9	2,742.4	134.3	164.9	16,297.4	664.6	943.4
10.0	12.5	685.6	33.6	41.2	4,074.4	166.2	235.8
15.0	5.6	304.7	14.9	18.3	1,810.8	73.9	104.8
20.0	3.1	171.4	8.4	10.3	1,018.6	41.5	59.0
25.0	2.0	109.7	5.6	6.6	651.9	26.6	37.7

¹ By random sampling formula.² International ¼-inch rule.

but the Forest Inventory and Analysis Unit holds it to a minimum by adequate training, experienced supervision, and emphasis on careful work.

The second type of error, sampling error, is the error associated with natural and expected deviation of the sample from the true population mean. Thus, the deviation is susceptible to a mathematical evaluation of the probability of error. Sampling errors for State totals in table XXIX are based on 1 standard deviation. That is, the chances are 2 out of 3 that if the results of a 100 percent census were known the sample results would be within the limits indicated.

Estimates smaller than State totals will have resultant larger sampling errors. The smaller the area examined, the larger the sampling error. In addition, as area or volume totals are stratified by forest type, species, diameter class, ownership, or other subunits, the sampling error increases and is greatest for the smallest divisions. The magnitude of this increase is depicted in table XXX and shows the sampling error to which the estimates are liable, 2 chances out of 3.

Definition of Terms

Forest Land Classes

Forest Land—Land at least 16.7 percent stocked by forest trees of any size, or formerly having such tree cover, and not currently developed for nonforest uses. Minimum area considered for classification is one acre. Forest land is divided into commercial categories: timberland, deferred timberland; and noncommercial

categories: productive-reserved forest land, unproductive forest land.

Timberland—Forest land that is producing, or is capable of producing, crops of industrial wood and not withdrawn from timber utilization. Timberland is synonymous with "commercial forest land" in prior reports.

Deferred Timberland—National forest land that meets productivity standards for timberland but is under study for possible inclusion in the wilderness system.

Productive-Reserved Forest Land—Productive public forest land withdrawn from timber utilization through statute or administrative regulations.

Unproductive Forest Land—Forest land incapable of yielding crops of industrial wood because of adverse site conditions.

Tree Classes

Commercial Species—Tree species currently or prospectively suitable for industrial wood products. Excluded are noncommercial species. See species list.

Noncommercial Species—Tree species of typical small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products. See species list.

Growing-Stock Trees—Live trees of commercial species classified as sawtimber, poletimber, sapling, and seedlings. Trees must have a 12-foot butt log now or prospectively to be classed as growing stock.

Rough Trees—Live trees of commercial species that are unmerchantable for saw logs currently or potentially because of roughness or poor form in the butt log.

Also included are all live trees of noncommercial species.

Rotten Trees—Live trees of commercial species that are unmerchantable for saw logs currently or potentially because of rot deduction in the butt log.

Cull Trees—Rough or rotten trees.

Hardwoods—Dicotyledonous trees, usually broad-leaved and deciduous.

Softwoods—Coniferous trees, usually evergreen, having needle or scalelike leaves.

Live Trees—All trees alive. Included are all size classes and all tree classes.

Salvable Dead Trees—Standing or down dead trees that were formerly growing stock and are considered merchantable.

Forest Types

Longleaf-Slash Pine—Forests in which longleaf or slash pine, singly or in combination, comprise a plurality of the stocking. Common associates include other southern pines, oak, and gum.

Loblolly-Shortleaf Pine—Forests in which pine and eastern redcedar (except longleaf or slash pine), singly or in combination, comprise a plurality of the stocking. Common associates include oak, hickory, and gum.

Oak-Pine—Forests in which hardwoods (usually upland oaks) comprise a plurality of the stocking, but in which softwoods, except cypress, comprise 25-49 percent of the stocking. Common associates include gum, hickory, and yellow-poplar.

Oak-Hickory—Forests in which upland oaks or hickory, singly or in combination, comprise a plurality of the stocking except where pines comprise 25-50 percent, in which case the stand would be classified oak-pine. Common associates include yellow-poplar, elm, maple, and black walnut.

Oak-Gum-Cypress—Bottomland forests in which tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination, comprise a plurality of the stocking except where pines comprise 25-50 percent, in which case the stand would be classified oak-pine. Common associates include cottonwood, willow, ash, elm, hackberry, and maple.

Elm-Ash-Cottonwood—Forests in which elm, ash, or cottonwood, singly or in combination, comprise a plurality of the stocking. Common associates include willow, sycamore, beech, and maple.

Nontyped—Timberland currently unoccupied with any live trees or seedlings, e.g., very recent clearcut areas.

Dimension Classes of Trees

Sawtimber Trees—Trees 9.0 inches and larger in d.b.h. for softwoods, and 11.0 inches and larger for hardwoods.

Poletimber Trees—5.0 to 8.9 inches in d.b.h. for softwoods and 5.0 to 10.9 inches d.b.h. for hardwoods.

Saplings—Trees 1.0 inch to 4.9 inches in d.b.h.

Seedlings—Trees which are less than 1.0 inch in d.b.h.

Rough, Rotten, and Salvable Dead Trees—See “tree classes.”

Stand-Size Classes

Sawtimber Stands—Stands at least 16.7 percent stocked with growing-stock trees, half or more of this stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber Stands—Stands at least 16.7 percent stocked with growing-stock trees, half or more of this stocking in sawtimber or poletimber trees, and with poletimber stocking exceeding that of sawtimber stocking.

Sapling-Seedling Stands—Stands at least 16.7 percent stocked with growing-stock trees, more than half of this stocking in saplings or seedlings.

NonStocked Stands—Stands less than 16.7 percent stocked with growing-stock trees.

Stocking

Stocking is a measure of the extent to which the growth potential of the site is utilized by trees or preempted by vegetative cover. Stocking is determined by comparing the stand density in terms of number of trees or basal area with a specified standard. Therefore, full stocking is 100 percent of the stocking standard.

Defined below are arbitrarily defined stocking categories.

Understocked—Stands 0 to 60 percent stocked.

Optimally stocked—Stands 61.0 to 100 percent stocked.

Overstocked—Stands greater than 100 percent stocked.

The tabulation by size class shows the density standard in terms of trees required per acre, for full stocking.

D.b.h. (inches)	Number of trees	D.b.h. (inches)	Number of trees
Seedlings	600	16	72
2	560	18	60
4	460	20	51
6	340	22	42
8	240	24	36
10	155	26	31
12	115	28	27
14	90	30	24

Volume

Volume of Cull—The volume of sound wood in the bole of rough and rotten trees.

Volume of Growing Stock—Volume of sound wood in the bole of sawtimber and poletimber trees from a 1-foot stump to a minimum 4.0-inch top outside bark or to the point where the central stem breaks into limbs. Rough, rotten, and noncommercial trees are excluded.

Volume of Sawtimber—Net volume of the saw-log portion of live sawtimber trees in board feet of the International 1/4-inch rule. Net volume equals gross volume less deductions for rot, sweep, and other defects that affect use for lumber to the point where the central stem breaks into limbs. Rough, rotten, and noncommercial trees are excluded.

Volume of Timber—The volume of sound wood in the bole of growing stock, rough, rotten, and salvable dead trees 5.0 inches and larger in d.b.h. from a 1-foot stump to a minimum 4.0-inch top outside bark, or to the point where the central stem breaks into limbs.

Growth Classes

Gross Growth—Total increase in stand volume computed on growing-stock trees. Gross growth equals survivor growth plus ingrowth plus growth on removals plus growth on mortality plus cull increment plus mortality.

Net Growth—Increase in stand volume, computed on growing-stock trees. Net growth is equal to gross growth minus mortality.

Net Change—Increase or decrease in stand volume, computed on growing-stock trees. Net change is equal to net growth minus removals.

Classes of Trees Used in Growth Computations

Survivor Trees—Merchantable-and-in at time 1 (previous inventory) and time 2 (current inventory).

Ingrowth Trees—Submerchantable-and-in at time 1 and merchantable-and-in at time 2.

Ongrowth Trees—Submerchantable-and-out at time 1 and merchantable-and-in at time 2; included with ingrowth component for growth computation.

Nongrowth Trees—Merchantable-and-out at time 1 and merchantable-and-in at time 2; included with survivor growth for growth computation.

Removal Trees—Merchantable-and-in at time 1 and removed prior to time 2.

Mortality Trees—Merchantable-and-in at time 1 and dead prior to time 2.

Ownership Classes

National Forest Land—Federal lands which have

been legally designated as National Forests or purchase units, and other lands under the administration of the Forest Service, including experimental areas.

Other Federal Land—Federal lands other than National Forests; lands administered by the Bureau of Land Management and Indian Lands.

State, County, and Municipal Lands—Lands owned by States, counties, and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

Forest Industry Land—Lands owned by companies or individuals operating wood-using plants (either primary or secondary).

Farmer Owned Land—Lands operated as a unit of 10 acres or more and from which the sale of agricultural products total \$1,000 or more annually.

Nonindustrial Private Land (Individual)—Lands privately owned by individuals other than forest industry, farmer owned, or miscellaneous private corporations.

Nonindustrial Private Land (Corporate)—Lands privately owned by private corporations other than forest industry and incorporated farms.

Miscellaneous Definitions

Basal Area—The area in square feet of the cross section at breast height of a single tree or of all the trees in a stand, usually expressed in square feet per acre.

Cull Increment—The change in growing-stock volume when growing-stock, rough, or rotten trees change tree class between time 1 and time 2 measurement periods. See explanation in Growth, Removals, and Mortality section.

D.b.h. (Diameter at breast height)—Tree diameter in inches, outside bark, measured at 4 1/2 feet above ground.

D.i.b. (Diameter inside bark)—Stem diameter of wood, bark excluded.

Diameter Classes—The 2-inch diameter-classes extend from 1.0 inch below to 0.9 inches above the stated midpoint. Thus, the 12-inch class includes trees 11.0 inches through 12.9 inches d.b.h.

D.o.b. (Diameter outside bark)—Stem diameter including bark.

Log Grades—A classification of logs based on external characteristics as indicators of quality or value.

Mortality—Number or sound-wood volume of live trees dying from natural causes during a specified period.

Plantations—Stands evidenced by regeneration from planting or seeding. Forest Survey categorizes plantations by forest type based upon plot tally.

Saw-Log Portion—That part of the bole of a sawtimber tree between a 1-foot stump and the saw-log top.

Saw-Log Top—The point on the bole of a sawtimber tree above which a saw log cannot be produced. The

minimum saw-log top is 7.0 inches diameter outside bark (d.o.b.) for softwoods and 9.0 inches d.o.b. for hardwoods.

Site Classes—A classification of forest land in terms of potential capacity to grow crops of industrial wood.

Timber Removals—The net volume of growing-stock trees removed from the inventory by harvesting or cultural operations such as timber-stand improvement, land clearing, or change in land use.

Tree Grade—The grade assigned to the entire log length of a sawtimber tree, which is based upon the log grade of the butt log portion (the first 16 feet) only. In past surveys, a log grade was assigned to each upper log based upon log grade standards.

Upper-Stem Portion—That part of the main stem or fork of a sawtimber tree above the saw-log top to a diameter outside bark of 4.0 inches or to the point where the main stem or fork breaks into limbs.

Species List

Scientific and common names of tree species sampled in Louisiana¹.

Commercial Species

Genus	Species	Common Name
Softwoods		
<i>Juniperus</i>	<i>silicicola</i>	southern redcedar
	<i>virginiana</i>	eastern redcedar
<i>Pinus</i>	<i>echinata</i>	shortleaf pine
	<i>elliottii</i>	slash pine
	<i>glabra</i>	spruce pine
	<i>palustris</i>	longleaf pine
	<i>serotina</i>	pondpine
	<i>taeda</i>	loblolly pine
<i>Taxodium</i>	<i>distichum</i> var.	
	<i>distichum</i>	baldcypress
	<i>distichum</i> var.	
	<i>nutans</i>	pondcypress

Hardwoods

<i>Acer</i>	<i>barbatum</i>	Florida maple
	<i>negundo</i>	boxelder
	<i>rubrum</i> var.	
	<i>rubrum</i>	red maple
	<i>saccharinum</i>	silver maple
	<i>sacharum</i>	sugar maple
<i>Betula</i>	<i>nigra</i>	river birch
<i>Carya</i>	sp.	hickory
	<i>aquatica</i>	water hickory
	<i>illinoensis</i>	pecan
<i>Castanea</i>	<i>dentata</i>	American chestnut

Genus	Species	Common name
<i>Celtis</i>	<i>laevigata</i>	sugarberry
	<i>occidentalis</i>	hackberry
<i>Cornus</i>	<i>florida</i>	flowering dogwood
<i>Diospyros</i>	<i>virginiana</i>	common persimmon
<i>Fagus</i>	<i>grandifolia</i>	American beech
<i>Fraxinus</i>	<i>americana</i>	white ash
	<i>pennsylvanica</i>	green ash
	<i>profunda</i>	pumpkin ash
<i>Gleditsia</i>	<i>aquatica</i>	water locust
	<i>triacanthos</i>	honey locust
<i>Ilex</i>	<i>opaca</i>	American holly
<i>Juglans</i>	<i>nigra</i>	black walnut
<i>Liquidambar</i>	<i>styraciflua</i>	sweetgum
<i>Liriodendron</i>	<i>tulipifera</i>	yellow-poplar
<i>Maclura</i>	<i>pomifera</i>	Osage-orange
<i>Magnolia</i>	<i>acuminata</i>	cucumbertree
	<i>grandiflora</i>	southern magnolia
	<i>virginiana</i>	sweetbay
<i>Morus</i>	<i>rubra</i>	red mulberry
<i>Nyssa</i>	<i>aquatica</i>	water tupelo
	<i>sylvatica</i>	black tupelo,
	var. <i>sylvatica</i>	blackgum
	<i>sylvatica</i>	swamp tupelo
	var. <i>biflora</i>	
<i>Persea</i>	<i>borbonia</i>	redbay
<i>Platanus</i>	<i>occidentalis</i>	American sycamore
<i>Populus</i>	sp.	cottonwood
<i>Prunus</i>	<i>serotina</i>	black cherry
<i>Quercus</i>	<i>alba</i>	white oak
	<i>bicolor</i>	swamp white oak
	<i>falcata</i>	
	var. <i>falcata</i>	southern red oak
	<i>falcata</i>	
	var. <i>pagodifolia</i>	cherrybark oak
	<i>laurifolia</i>	laurel oak
	<i>lyrata</i>	overcup oak

¹ Names according to: Little, Elbert L., Jr. Checklist of United States Trees (Native and Naturalized). 1978. U.S. Dept. Agr. Handbook No. 541, 375p.

Genus	Species	Common Name	Noncommercial Species		
	<i>michauxii</i>	swamp chestnut oak			
	<i>muehlenbergii</i>	chinkapin oak	Genus	Species	Common Name
	<i>nigra</i>	water oak			
	<i>nuttallii</i>	Nuttall oak	<i>Aesculus</i>	sp.	buckeye
	<i>palustris</i>	pin oak	<i>Bumelia</i>	sp.	chittamwood, gum bumelia
	<i>phellos</i>	willow oak			
	<i>prinus</i>	chestnut oak	<i>Carpinus</i>	<i>caroliniana</i>	bluebeech, American hornbeam
	<i>shumardii</i>	Shumard oak			
	<i>stellata</i>		<i>Castanea</i>	sp.	chinkapin
	var. <i>stellata</i>	post oak	<i>Cercis</i>	<i>canadensis</i>	eastern redbud
	<i>stellata</i>		<i>Crataegus</i>	sp.	hawthorn
	var. <i>paludosa</i>	Delta post oak	<i>Magnolia</i>	<i>macrophylla</i>	bigleaf magnolia
	<i>velutina</i>	black oak	<i>Malus</i>	sp.	apple
<i>Robinia</i>	<i>pseudoacacia</i>	black locust	<i>Melia</i>	<i>azedarach</i>	chinaberry
<i>Salix</i>	sp.	willow	<i>Ostrya</i>	<i>virginiana</i>	eastern hophornbeam, ironwood
<i>Sassafras</i>	<i>albidum</i>	sassafras			
<i>Tilia</i>	<i>americana</i>	American basswood	<i>Oxydendrum</i>	<i>arboreum</i>	sourwood
			<i>Planera</i>	<i>aquatica</i>	water-elm
	<i>heterophylla</i>	white basswood	<i>Prunus</i>	sp.	plums, cherries
<i>Ulmus</i>	<i>alata</i>	winged elm	<i>Quercus</i>	<i>incana</i>	bluejack oak
	<i>americana</i>	American elm		<i>marilandica</i>	blackjack oak
	<i>crassifolia</i>	cedar elm		<i>virginiana</i>	live oak
	<i>rubra</i>	slippery elm	<i>Vaccinium</i>	<i>arboreum</i>	sparkleberry

Standard Tables

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Table 1.—Area by land classes, Louisiana, 1984

Land class	Area
	<i>Thousand acres</i>
Forest	
Commercial:	
Timberland	13,872.6
Deferred timberland	...
Non-commercial:	
Productive-reserved	10.1
Unproductive	...
Total forest	13,882.7
Nonforest	
Cropland ¹	6,093.5
Other ²	8,517.5
Total Nonforest	14,611.0
All land ³	28,493.7

¹ U.S. Department of Commerce, Bureau of Census, 1982 Census of Agriculture, Volume 1: State and County Data.

² Includes pasture range, swampland, industrial, urban, and other nonforest land classed as water by Forest Survey standards, but defined by the Bureau of the Census as land.

³ Bureau of Census, 1980.

Table 2.—Area of timberland by ownership classes, Louisiana, 1984¹

Ownership class	Area
	<i>Thousand acres</i>
Public	
National Forest	620.9
Other federal	212.4
State	329.8
County	167.6
Total public	1,330.8
Private	
Forest industry ²	3,603.1
Farmer	928.3
Miscellaneous private:	
Individual	5,813.5
Corporate	2,196.9
Total private	12,541.8
All ownerships	13,872.6

¹ Rows and columns may not sum due to rounding.

² Not including 666,800 acres of farmer-owned and miscellaneous private lands leased to forest industry.

Table 3.—Area of timberland by stand size and ownership classes, Louisiana, 1984¹

Stand size class	All ownerships	National Forest	Other public	Forest industry	Farmer	Miscellaneous private
	<i>Thousand acres</i>					
Sawtimber	8,178.9	424.0	492.6	1,728.7	585.4	4,948.1
Poletimber	2,718.9	74.9	96.0	749.8	178.2	1,620.0
Sapling and seedling	2,525.8	122.0	72.8	1,034.6	132.2	1,164.1
Nonstocked areas	449.0	...	48.4	89.9	32.5	278.3
All classes	13,872.6	620.9	709.8	3,603.1	928.3	8,010.5

¹ Rows and columns may not sum due to rounding.

Table 4.—Area of timberland by stand volume and ownership classes, Louisiana, 1984¹

Stand volume per acre	All ownerships	National Forest	Other public	Forest industry	Farmer	Miscellaneous private
<i>Board feet²</i>	<i>Thousand acres</i>					
Less than 1,500	4,196.3	137.6	172.8	1,345.8	264.6	2,275.6
1,500 to 5,000	4,268.4	150.6	267.4	957.9	306.0	2,586.5
More than 5,000	5,407.8	332.7	269.7	1,299.4	357.7	3,148.3
All classes	13,872.6	620.9	709.8	3,603.1	928.3	8,010.5

¹ Rows and columns may not sum due to rounding.² International ¼-inch rule.Table 5.—Area of timberland by percent growing-stock trees and cull trees, Louisiana, 1984¹.

Growing-stock trees	Cull trees percent stocking							
	Total	0-10	10-20	20-30	30-40	40-50	50-60	60+
<i>Percent stocking</i>	<i>Thousand acres</i>							
0-10	245.1	56.4	13.9	6.4	14.9	5.9	22.6	125.0
10-20	300.9	29.1	...	51.3	24.0	59.1	23.5	114.0
20-30	500.4	28.3	34.8	22.1	40.8	67.8	81.8	224.8
30-40	756.2	76.7	66.0	73.2	118.4	65.9	133.2	223.0
40-50	1,143.9	100.1	156.2	120.9	172.8	178.3	193.8	221.9
50-60	1,101.0	125.7	112.3	155.9	152.0	184.2	184.2	186.6
60-70	1,347.4	124.0	206.5	197.1	265.7	219.1	181.4	153.6
70-80	1,574.9	210.0	229.6	349.1	281.6	246.6	158.7	99.3
80-90	1,551.5	321.1	270.1	380.0	320.1	165.5	53.2	41.5
90-100	1,363.5	293.0	362.4	340.6	195.0	80.1	66.7	25.5
100-110	1,321.6	334.3	381.6	259.9	208.2	94.5	43.0	...
110-120	1,060.5	359.4	294.3	233.6	108.1	65.1	...	...
120-130	720.3	259.6	313.5	98.5	48.7	...	...	...
130-140	493.8	289.5	153.4	51.0	...	...	...	...
140-150	241.9	150.0	80.2	11.7	...	...	...	...
150-160	109.2	97.6	11.6	...	...	...	...	...
160+	40.7	40.7	...	...	...	...	...	...
Total	13,872.6	2,895.4	2,686.5	2,351.1	1,950.3	1,432.2	1,142.0	1,415.1

¹ Rows and columns may not sum due to rounding.

Table 6.—Average basal area of live trees on timberland by ownership and timber classes, Louisiana, 1984¹

Owner and tree classes	All species	Softwood			Hardwood		
		Sapling & seedling	Poletimber	Sawtimber	Sapling & seedling	Poletimber	Sawtimber
----- Square feet per acre -----							
National forest:							
Growing stock	68.4	2.5	5.2	37.5	2.8	9.1	11.3
Rough and rotten	17.4	1.1	1.0	0.6	5.8	4.1	4.9
Total	85.8	3.6	6.2	38.1	8.6	13.2	16.1
Other public:							
Growing stock	60.9	1.5	3.1	12.3	2.0	10.8	31.3
Rough and rotten	29.2	0.6	0.2	1.1	5.0	7.8	14.5
Total	90.1	2.0	3.3	13.4	7.0	18.6	45.8
Forest industry:							
Growing stock	62.2	5.9	10.9	21.7	3.1	8.0	12.6
Rough and rotten	17.9	1.5	0.8	0.6	6.1	4.0	5.0
Total	80.1	7.4	11.7	22.3	9.2	12.0	17.6
Farmer:							
Growing stock	64.4	1.5	3.8	18.6	4.1	15.8	20.6
Rough and rotten	28.4	0.5	0.4	0.8	7.0	7.7	12.0
Total	92.8	2.0	4.2	19.4	11.1	23.5	32.6
Miscellaneous private:							
Growing stock	69.3	2.4	7.7	24.2	3.7	12.5	18.9
Rough and rotten	25.3	0.9	0.6	1.5	7.1	6.0	9.2
Total	94.6	3.2	8.3	25.7	10.8	18.5	28.1
All owners:							
Growing stock	66.6	3.2	7.9	23.2	3.4	11.3	17.7
Rough and rotten	23.5	1.0	0.6	1.2	6.7	5.6	8.4
Total	90.1	4.2	8.5	24.3	10.1	16.9	26.1

¹ Rows and columns may not sum due to rounding.

Table 7.—Area of timberland by site and ownership classes, Louisiana, 1984¹

Site class	All ownerships	National forest	Other public	Forest industry	Farmer	Miscellaneous private
----- Thousand acres -----						
165 ft ³ or more	1,477.1	52.6	92.0	407.4	129.2	795.9
120 to 165 ft ³	3,821.0	202.4	71.1	1,178.7	302.7	2,066.1
85 to 120 ft ³	5,142.1	262.5	302.1	1,299.5	291.9	2,986.1
50 to 85 ft ³	3,049.5	92.4	211.9	682.0	188.6	1,874.6
Less than 50 ft	382.9	11.1	32.8	35.4	15.8	287.9
All classes	13,872.6	620.9	709.8	3,603.1	928.3	8,010.5

¹ Rows and columns may not sum due to rounding.

Table 8.—Area of timberland by forest types and ownership classes, Louisiana, 1984¹

Type	All ownerships	National Forest	Other public	Forest industry	Farmer	Miscellaneous private
----- Thousand acres -----						
Longleaf-slash pine	933.2	108.0	17.9	274.1	11.5	521.6
Loblolly-shortleaf pine	4,033.2	245.0	103.3	1,417.7	211.4	2,055.9
Oak-pine	1,913.3	111.0	49.3	635.5	83.6	1,033.9
Oak-hickory	2,170.7	97.8	23.9	661.5	194.2	1,193.3
Oak-gum-cypress	4,377.6	59.1	428.2	559.4	391.0	2,939.3
Elm-ash-cottonwood	412.4	...	87.2	41.4	36.5	247.3
Nontyped ²	32.3	...	...	13.6	...	18.7
All types	13,872.6	620.9	709.8	3,603.1	928.3	8,010.5

¹ Rows and columns may not sum due to rounding.² No live trees, saplings, or seedlings.

Table 9.—Area of noncommercial forest land by forest types, Louisiana, 1984

Type	All areas	Productive reserved areas	Unproductive areas
----- Thousand acres -----			
Longleaf-slash pine	...	...	...
Loblolly-shortleaf pine	...	10.1	...
Oak-pine	...	...	...
Oak-hickory	...	...	...
Oak-gum-cypress	...	...	...
Elm-ash-cottonwood	...	...	...
All types	...	10.1	...

Table 10.—Number of growing-stock trees on timberland by species and diameter classes, Louisiana, 1984¹

Species	Diameter class (inches at breast height)										
	All classes	5.0— 6.9	7.0— 8.9	9.0— 10.9	11.0— 12.9	13.0— 14.9	15.0— 16.9	17.0— 18.9	19.0— 20.9	21.0— 28.9	29.0 & larger
----- Thousand trees -----											
Softwood:											
Longleaf pine	32,370	8,072	7,422	6,050	4,136	2,776	2,095	1,089	474	249	8
Slash pine	89,063	30,680	29,849	18,436	5,909	2,915	867	308	57	43	...
Shortleaf pine	87,620	26,286	21,871	17,209	10,606	6,426	2,996	1,528	329	369	...
Loblolly pine	474,280	170,795	99,750	75,359	47,243	33,347	21,953	12,742	6,626	6,132	335
Spruce pine	4,482	704	399	866	674	646	409	390	216	144	35
Other pines	48	...	...	...	48	...	...	...	...	...	...
Redcedar	826	397	260	157	...	...	...	...	...	11	...
Cypress	80,795	18,489	16,265	12,011	11,018	7,959	6,415	3,790	2,364	2,409	74
Total	769,483	255,422	175,815	130,088	79,634	54,068	34,736	19,847	10,067	9,355	451
Hardwood:											
Select white oaks ²	30,972	11,569	6,226	4,620	3,501	1,714	1,299	791	531	651	68
Select red oaks ³	17,476	6,363	2,828	2,482	1,604	1,486	804	719	428	681	80
Other white oaks	38,427	11,527	8,739	5,652	4,267	2,958	1,917	1,330	676	1,175	186
Other red oaks	123,105	33,699	28,612	20,570	14,880	8,203	5,946	4,247	2,221	4,126	601
Sweet pecan	4,040	1,734	615	415	283	337	124	218	123	159	32
Water hickory	15,692	4,467	2,119	3,310	1,626	1,850	946	511	249	515	100
Other hickories	19,906	6,606	4,364	3,085	2,764	1,073	937	575	237	250	15
Persimmon	2,437	1,682	433	322	...	...	...	...	...	...	...
Hard maple	150	...	...	...	56	77	...	...	...	17	...
Soft maple	28,591	14,037	8,800	2,807	1,267	757	495	186	123	109	10
Boxelder	4,578	1,751	849	1,152	523	80	144	80	...	...	...
Beech	5,468	1,021	217	922	686	644	705	334	357	561	20
Sweetgum	150,943	62,585	36,641	21,435	12,051	8,382	4,515	2,443	1,730	1,150	10
Blackgum	30,689	11,854	8,098	4,554	1,933	1,753	1,437	634	281	146	...
Other gums/tupelos	73,216	12,932	17,717	16,566	11,922	7,399	3,831	1,416	801	613	18
White ash	3,229	1,222	556	314	432	369	220	23	63	30	...
Other ashes	31,480	9,329	7,631	5,443	3,273	1,900	1,743	930	541	667	23
Sycamore	6,345	2,072	1,588	867	894	225	277	157	163	88	14
Cottonwood	7,304	1,060	2,331	1,322	841	539	458	310	122	265	57
Basswood	556	407	...	78	...	43	28	...	...	...	...
Yellow-poplar	2,212	207	689	169	333	284	137	204	91	76	22
Magnolia	1,214	...	482	261	105	185	...	77	62	43	...
Sweetbay	6,115	1,961	2,298	762	459	416	101	118	...	...	...
Willow	18,820	4,972	3,703	2,607	2,288	1,567	1,171	950	462	1,003	99
Black cherry	2,368	854	540	583	170	79	100	25	18	...	...
American elm	13,168	4,502	3,407	1,471	1,548	864	559	453	198	165	...
Other elms	14,288	4,816	4,698	1,815	1,384	779	318	239	86	143	10
River birch	359	...	...	275	...	...	32	52	...	...	...
Hackberry	22,357	7,111	5,296	3,623	2,187	1,657	1,094	933	198	258	...
Black locust	868	753	115	...	...	...	...	...	...	...	...
Other locusts	3,379	1,070	570	602	381	350	192	45	77	75	18
Sassafras	1,288	1,010	159	72	...	...	31	...	18	...	...
Dogwood	1,997	1,843	149	...	...	...	...	...	...	...	...
Holly	3,797	3,061	429	93	58	120	35	...	...	...	...
Other commerical hardwoods	1,344	895	178	166	72	...	33	...	...	...	...
Total	688,177	228,975	161,077	108,414	71,788	46,091	29,629	17,999	9,856	12,965	1,383
Total all species	1,457,660	484,396	336,892	238,502	151,422	100,159	64,365	37,846	19,923	22,321	1,834

¹ Rows and columns may not sum due to rounding.
² Includes white, swamp chestnut, swamp white, and chinkapin oak (Durand and bur oak are select white oaks but did not occur in the Louisiana sample).
³ Includes cherrybark and Shumard oak (northern red oak is a select red oak but did not occur in the Louisiana sample).

Table 11.—*Volume of timber on timberland by classes of timber and by softwoods and hardwoods, Louisiana, 1984¹*

Class of timber	All species	Softwood	Hardwood
----- Million cubic feet -----			
Sawtimber trees:			
Saw-log portion	12,959.6	7,922.1	5,037.4
Upper-stem portion	1,887.9	996.0	891.8
Total	14,847.4	8,918.2	5,929.2
Poletimber trees	4,144.6	1,633.8	2,510.8
All growing stock	18,992.0	10,552.0	8,440.0
Rough trees	2,385.4	324.2	2,061.2
Rotten trees	646.0	68.6	577.4
Salvable dead trees	185.5	107.1	78.4
All timber	22,208.9	11,052.0	11,156.9

¹ Rows and columns may not sum due to rounding.

Table 12.—*Volume of growing stock and sawtimber on timberland by ownership classes and by softwoods and hardwoods, Louisiana, 1984¹*

Ownership class	Growing stock			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
----- Million cubic feet -----				----- Million board feet ² -----		
National Forest	1,064.3	774.6	289.8	4,793.3	3,985.6	807.8
Other public	894.4	277.2	617.2	3,497.2	1,276.6	2,220.6
Forest industry	4,431.1	2,779.5	1,651.6	17,073.1	11,863.0	5,210.1
Farmer	1,214.6	527.8	686.8	4,190.4	2,278.3	1,912.0
Miscellaneous private	11,387.6	6,193.0	5,194.6	41,181.1	26,041.9	15,139.3
All ownerships	18,992.0	10,552.0	8,440.0	70,735.1	45,445.4	25,289.8

¹ Rows and columns may not sum due to rounding.

² International ¼-inch rule.

Table 13.—Volume of growing-stock on timberland by species and diameter classes, Louisiana, 1984¹

Species	Diameter class (inches at breast height)										
	All classes	5.0—6.9	7.0—8.9	9.0—10.9	11.0—12.9	13.0—14.9	15.0—16.9	17.0—18.9	19.0—20.9	21.0—28.9	29.0 & larger
----- Million cubic feet -----											
Softwood:											
Longleaf pine	438.2	16.5	48.2	65.6	73.8	71.6	70.8	49.8	25.1	15.3	1.5
Slash pine	790.5	80.1	199.8	228.1	122.5	99.1	35.8	16.1	4.5	4.5	...
Shortleaf pine	1,141.3	66.1	153.4	220.7	226.9	200.3	130.7	85.5	22.7	35.1	...
Loblolly pine	6,587.4	359.1	588.0	899.0	941.3	996.6	896.8	713.6	487.5	641.8	63.7
Spruce pine	125.4	1.8	3.4	12.1	13.4	19.2	19.0	20.9	14.4	12.9	8.4
Other pines	1.4	...	...	...	1.4	...	...	...	...	...	...
Redcedar	4.7	0.6	0.7	2.0	...	...	...	...	...	1.3	...
Cypress	1,463.0	32.1	84.0	138.6	203.9	218.3	242.3	183.9	143.7	206.5	9.7
Total	10,552.0	556.3	1,077.5	1,566.2	1,583.2	1,605.1	1,395.4	1,069.7	697.9	917.4	83.3
Hardwood:											
Select white oaks ²	367.5	24.6	35.5	48.7	59.1	44.8	45.3	30.4	26.9	43.4	8.8
Select red oaks ³	297.7	15.5	17.1	28.7	32.0	41.4	30.8	36.3	28.6	54.1	13.2
Other white oaks	476.2	20.6	45.6	55.2	61.4	60.4	50.7	52.4	30.9	76.8	22.2
Other red oaks	1,869.2	76.6	169.7	222.7	262.0	200.2	197.3	185.7	119.3	341.0	94.7
Sweet pecan	77.2	7.5	3.9	5.1	5.2	11.0	5.1	12.0	6.7	17.2	3.5
Water hickory	223.6	10.4	10.4	29.2	23.5	40.0	24.2	20.5	12.3	35.1	17.9
Other hickories	261.8	14.8	25.4	34.7	53.9	29.2	33.3	28.6	14.5	24.7	2.8
Persimmon	9.5	4.0	1.6	3.9	...	...	...	...	...	...	...
Hard maple	3.2	...	...	...	0.5	1.7	...	...	...	1.0	...
Soft maple	182.4	31.7	50.0	27.6	20.2	18.0	12.9	8.5	5.5	6.8	1.2
Boxelder	31.7	3.6	4.5	8.2	7.3	1.9	4.1	2.1	...	...	...
Beech	127.2	2.4	1.3	7.5	10.0	12.3	24.2	12.6	17.5	36.7	2.8
Sweetgum	1,578.1	123.2	214.4	243.4	226.8	237.2	187.4	125.2	113.9	103.9	2.7
Blackgum	271.9	22.5	39.8	42.2	28.8	40.2	43.1	27.8	15.3	12.2	...
Other gums/tupelos	874.7	23.8	85.3	163.4	189.8	164.1	115.4	54.6	37.8	39.2	1.4
White ash	37.7	2.6	3.5	3.3	6.9	9.0	6.4	1.2	2.5	2.3	...
Other ashes	395.0	23.8	45.0	57.6	51.0	47.6	51.5	39.6	27.2	48.3	3.3
Sycamore	92.8	4.9	8.0	10.4	17.1	7.0	11.6	9.1	13.2	9.1	2.3
Cottonwood	170.1	3.2	14.0	16.5	17.9	19.2	17.7	16.9	9.8	37.0	17.9
Basswood	5.1	1.3	...	0.8	...	1.6	1.5	...	...	...	...
Yellow-poplar	52.6	0.5	4.8	2.1	7.8	8.3	5.2	9.3	5.1	5.7	3.7
Magnolia	21.9	...	2.8	3.3	2.5	4.0	...	2.7	3.9	2.7	...
Sweetbay	58.8	5.4	14.6	9.0	9.4	11.8	3.5	5.2	...	...	...
Willow	361.9	8.6	21.9	26.4	43.5	44.9	42.3	41.5	27.1	91.8	13.8
Black cherry	20.3	1.2	3.3	5.2	2.8	2.4	3.5	1.0	1.0	...	...
American elm	130.8	10.1	16.2	12.5	21.2	17.0	14.6	17.6	8.6	13.0	...
Other elms	127.6	9.8	27.1	17.7	20.5	17.4	9.6	10.0	3.6	9.5	2.2
River birch	5.5	...	...	2.7	...	...	0.7	2.1	...	...	...
Hackberry	236.2	12.9	26.1	33.1	33.5	34.9	33.4	33.2	10.7	18.4	...
Black locust	2.7	2.0	0.7	...	...	...	...	...	...	...	...
Other locusts	41.9	2.7	2.3	5.2	6.5	7.7	4.3	1.3	3.9	5.2	2.7
Sassafras	6.6	1.6	0.8	1.2	...	...	1.1	...	1.8	...	...
Dogwood	3.2	2.8	0.4	...	...	...	...	...	...	...	...
Holly	12.5	6.3	1.9	0.6	0.7	2.4	0.7	...	...	...	...
Other commerical hardwoods	4.9	1.8	0.5	1.4	0.4	...	0.8	...	...	...	...
Total	8,440.0	482.7	898.4	1,129.7	1,222.5	1,137.4	982.0	787.4	547.8	1,035.2	216.9
Total all species	18,992.0	1,039.0	1,976.0	2,695.8	2,805.7	2,742.5	2,377.4	1,857.1	1,245.7	1,952.5	300.2

¹ Rows and columns may not sum due to rounding.² Includes white, swamp chestnut, swamp white, and chinkapin oak (Durand and bur oak are select white oaks but did not occur in the Louisiana sample).³ Includes cherrybark and Shumard oak (northern red oak is a select red oak but did not occur in the Louisiana sample).

Table 14.—Volume of sawtimber on timberland by species and diameter classes, Louisiana, 1984¹

Species	Diameter class (inches at breast height)								
	All classes	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
----- Million board feet ⁴ -----									
Softwood:									
Longleaf pine	1,666.8	239.4	301.2	315.9	334.5	251.0	130.6	85.1	9.1
Slash pine	2,114.1	866.4	506.5	440.8	167.6	80.2	25.2	27.4	...
Shortleaf pine	4,701.1	893.6	1,063.2	1,048.1	752.5	533.2	152.7	257.8	...
Loblolly pine	31,113.0	3,652.9	4,390.5	5,197.4	5,119.3	4,395.1	3,197.2	4,663.1	497.4
Spruce pine	624.7	54.1	62.8	95.5	97.5	111.0	78.6	73.5	51.8
Other pines	6.3	...	6.3	...	...	...	...	...	...
Redcedar	17.7	9.5	...	...	...	...	...	8.2	...
Cypress	5,201.8	170.5	634.8	784.3	968.2	801.6	679.9	1,103.3	59.2
Total	45,445.4	5,886.3	6,965.3	7,881.9	7,439.6	6,172.1	4,264.3	6,218.4	617.5
Hardwood:									
Select white oaks ²	1,090.2	...	202.4	171.9	188.5	133.6	128.9	216.4	48.6
Select red oaks ³	1,039.1	...	113.0	159.4	127.8	160.0	132.5	273.0	73.4
Other white oaks	1,621.4	...	224.4	237.9	217.7	244.2	151.0	410.8	135.3
Other red oaks	6,254.1	...	930.6	771.9	828.4	846.2	567.0	1,761.2	548.8
Sweet pecan	275.6	...	17.3	40.8	20.8	51.8	31.3	92.3	21.2
Water hickory	758.6	...	76.8	145.8	97.8	89.6	56.7	182.5	109.4
Other hickories	807.6	...	196.2	117.7	145.0	130.1	69.9	132.6	16.1
Hard maple	13.9	...	2.1	6.7	...	...	...	5.2	...
Soft maple	280.9	...	63.0	63.9	50.4	36.4	25.9	34.5	6.9
Boxelder	53.3	...	22.6	6.2	16.1	8.3	...	...	...
Beech	542.6	...	36.2	49.0	102.1	58.4	83.3	195.8	17.9
Sweetgum	4,226.3	...	655.9	866.9	809.8	624.3	625.4	627.0	16.9
Blackgum	703.5	...	79.9	144.2	182.1	137.4	82.7	77.3	...
Other gums/tupelos	2,295.7	...	600.8	595.9	463.4	238.6	179.4	209.0	8.5
White ash	114.9	...	25.0	33.6	24.9	5.6	11.2	14.7	...
Other ashes	1,093.2	...	156.6	171.8	203.4	169.7	123.4	247.2	21.0
Sycamore	279.2	...	52.0	25.8	46.3	36.8	58.7	45.6	14.0
Cottonwood	610.4	...	54.8	68.7	67.0	70.1	45.1	190.8	114.0
Basswood	13.0	...	...	6.2	6.8	...	...	...	...
Yellow-poplar	202.0	...	23.6	31.5	21.0	41.2	25.1	32.2	27.5
Magnolia	68.9	...	8.7	15.4	...	11.9	18.8	14.1	...
Sweetbay	116.7	...	32.2	45.8	14.8	23.9	...	...	...
Willow	1,290.9	...	136.6	154.5	158.2	172.2	122.5	465.0	81.8
Black cherry	43.3	...	10.2	9.5	14.3	4.5	4.7	...	...
American elm	377.3	...	69.5	62.7	57.6	77.8	40.8	68.7	...
Other elms	292.9	...	68.2	66.0	38.7	42.1	14.7	48.2	15.0
River birch	12.5	...	...	...	2.9	9.6	...	...	...
Hackberry	649.3	...	105.6	124.5	132.5	141.7	48.7	96.4	...
Other locusts	130.8	...	22.2	27.5	15.9	5.5	18.5	26.3	14.9
Sassafras	13.4	...	...	...	4.7	...	8.6	...	...
Holly	13.9	...	2.4	8.8	2.6	...	...	...	...
Other commercial hardwoods	4.5	...	1.5	...	3.0	...	...	...	...
Total	25,289.8	...	3,990.2	4,230.5	4,064.7	3,571.5	2,674.7	5,466.7	1,291.5
Total all species	70,735.2	5,886.3	10,955.5	12,112.3	11,504.2	9,743.7	6,939.0	11,685.1	1,909.0

¹ Rows and columns may not sum due to rounding.² Includes white, swamp chestnut, swamp white, and chinkapin oak (Durand and bur oak are select white oaks but did not occur in the Louisiana sample).³ Includes cherrybark and Shumard oak (northern red oak is a select red oak but did not occur in the Louisiana sample).⁴ International ¼-inch rule.

Table 15.—Volume of sawtimber on timberland by species and tree grades, Louisiana, 1984¹

Species	All grades	Grade 1	Grade 2	Grade 3	Grade 4
----- Million board feet ⁴ -----					
Softwood:					
Yellow pines	40,225.9	5,645.3	7,042.3	27,538.3	...
Cypress	5,201.8	1,430.9	1,468.5	2,302.4	...
Redcedar	17.7	17.7	...	...	...
Total	45,445.4	7,093.9	8,510.7	29,840.7	...
Hardwood:					
Select white ² and red oaks ³	2,129.3	342.9	516.4	837.5	432.6
Other white and red oaks	7,875.5	618.7	1,508.7	3,119.6	2,628.5
Hickory	1,841.8	230.6	485.8	806.7	318.7
Hard maple	13.9	...	4.1	7.8	2.1
Sweetgum	4,226.3	769.6	1,147.2	1,753.6	555.9
Tupelo and blackgum	2,999.2	506.3	915.8	1,489.0	88.1
Ash, walnut, and black cherry	1,251.4	198.9	431.2	587.1	34.1
Yellow-poplar	202.0	50.4	22.4	46.6	82.5
Other commerical hardwoods	4,750.4	639.5	971.2	2,150.7	989.0
Total	25,289.8	3,356.9	6,002.7	10,798.6	5,131.5
Total all species	70,735.2	10,450.9	14,513.5	40,639.3	5,131.5

¹ Rows and columns may not sum due to rounding.² Includes white, swamp chestnut, swamp white, and chinkapin oak (Durand and bur oak are select white oaks but did not occur in the Louisiana sample).³ Includes cherrybark and Shumard oak (northern red oak is a select red oak but did not occur in the Louisiana sample).⁴ International ¼-inch rule.Table 16.—Periodic net annual growth and removals of growing stock on timberland by species, Louisiana, 1974-1984¹

Species	Periodic net annual growth	Periodic annual removals
----- Million cubic feet -----		
Softwood:		
Yellow pines	520.4	426.9
Cypress	24.7	4.7
Redcedar	0.3	...
Total	545.3	431.6
Hardwood:		
Select white ² and red oaks ³	33.1	17.3
Other white and red oaks	105.7	65.8
Hickory	17.4	16.1
Hard maple	0.1	...
Sweetgum	58.7	36.4
Tupelo and blackgum	10.4	8.4
Ash, walnut, and black cherry	11.9	7.9
Yellow-poplar	2.8	0.3
Other commercial hardwoods	54.0	26.1
Total	294.0	178.4
Total all species	839.4	610.0

¹ Rows and columns may not sum due to rounding.² Includes white, swamp chestnut, swamp white, and chinkapin oak (Durand and bur oak are select white oaks but did not occur in the Louisiana sample).³ Includes cherrybark and Shumard oak (northern red oak is a select red oak but did not occur in the Louisiana sample)

Table 17.—Periodic net annual growth and removals of growing stock on timberland by species group and ownership classes, Louisiana, 1974-1984¹

Ownership class	Periodic net annual growth			Periodic annual removals		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
----- Million cubic feet -----						
National Forest	40.9	29.6	11.3	30.2	25.6	4.6
Other public	30.8	10.6	20.1	15.7	9.9	5.9
Forest industry	238.2	175.8	62.4	229.6	173.7	55.9
Farmer	49.2	24.1	25.0	39.2	20.3	18.9
Miscellaneous private	480.3	305.2	175.1	295.3	202.2	93.1
All ownerships	839.4	545.3	294.0	610.0	431.6	178.4

¹ Rows and columns may not sum due to rounding.

Table 18.—Periodic net annual growth and removals of sawtimber on timberland by species, Louisiana, 1974-1984¹

Species	Periodic net annual growth	Periodic annual removals
----- Million board feet ⁴ -----		
Softwood:		
Yellow pines	2,548.8	1,884.9
Cypress	128.1	19.2
Redcedar	0.8	...
Total	2,677.7	1,904.1
Hardwood:		
Select white ² and red oaks ³	118.5	57.0
Other white and red oaks	416.3	199.4
Hickory	70.2	53.8
Hard maple	0.3	...
Sweetgum	176.1	108.0
Tupelo and blackgum	65.7	29.5
Ash, walnut, and black cherry	41.7	22.8
Yellow-poplar	11.6	1.1
Other commercial hardwoods	189.6	78.3
Total	1,090.0	550.0
Total all species	3,767.7	2,454.1

¹ Rows and columns may not sum due to rounding.

² Includes white, swamp chestnut, swamp white, and chinkapin oak (Durand and bur oak are select white oaks but did not occur in the Louisiana sample).

³ Includes cherrybark and Shumard oak (northern red oak is a select red oak but did not occur in the Louisiana sample).

⁴ International 1/4-inch rule.

Table 19.—*Periodic net annual growth and removals of sawtimber on timberland by ownership classes and by softwoods and hardwoods, Louisiana, 1974-1984*¹

Ownership class	Periodic net annual growth			Periodic annual removals		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
----- Million board feet ² -----						
National Forest	207.5	170.7	36.7	128.6	114.4	14.1
Other public	151.0	61.5	89.6	67.6	48.1	19.5
Forest industry	1,033.0	795.7	237.3	984.7	804.8	179.9
Farmer	218.7	134.6	84.1	138.2	80.8	57.3
Miscellaneous private	2,157.5	1,515.2	642.3	1,135.1	856.0	279.1
All ownerships	3,767.7	2,677.7	1,090.0	2,454.1	1,904.1	550.0

¹ Rows and columns may not sum due to rounding.

² International ¼-inch rule.

Table 20.—*Periodic annual mortality of growing stock and sawtimber on timberland by species, Louisiana, 1974-1984*¹

Species	Growing stock	Sawtimber
	Million cubic feet	Million board feet ⁴
Softwood:		
Yellow pines	53.7	169.1
Cypress	0.8	2.4
Redcedar	0.1	0.5
Total	54.6	171.9
Hardwood:		
Select white ² and red oaks ³	3.0	7.8
Other white and red oaks	16.9	48.1
Hickory	4.8	16.7
Sweetgum	12.0	33.6
Tupelo and blackgum	10.2	28.9
Ash, walnut, and black cherry	3.9	8.7
Other commercial hardwoods	23.2	64.5
Total	74.1	208.3
Total all species	128.8	380.2

¹ Rows and columns may not sum due to rounding.

² Includes white, swamp chestnut, swamp white, and chinkapin oak (Durand and bur oak are select white oaks but did not occur in the Louisiana sample).

³ Includes cherrybark and Shumard oak (northern red oak is a select red oak but did not occur in the Louisiana sample).

⁴ International ¼-inch rule.

Table 21.—Periodic annual mortality of growing stock and sawtimber on timberland by ownership classes and by softwoods and hardwoods, Louisiana, 1984¹

Ownership class	Growing stock			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	----- Million cubic feet -----			----- Million board feet ² -----		
National Forest	4.1	2.9	1.2	10.9	9.2	1.7
Other public	6.4	1.3	5.1	21.1	4.2	16.8
Forest industry	27.4	14.0	13.4	96.5	52.9	43.6
Farmer	9.6	3.0	6.5	26.5	8.2	18.3
Miscellaneous private	81.3	33.4	47.8	225.2	97.4	127.8
All ownerships	128.8	54.6	74.1	380.2	171.9	208.3

¹ Rows and columns may not sum due to rounding.

² International ¼-inch rule.

Table 22.—Periodic annual mortality of growing stock and sawtimber on timberland by cause of death and by softwoods and hardwoods, Louisiana, 1984¹

Cause of death	Growing stock			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	----- Million cubic feet -----			----- Million board feet ² -----		
Bark beetles	21.2	21.0	0.2	68.7	68.1	0.6
Other insects	0.5	0.4	0.1	1.7	1.7	...
Disease	58.2	15.8	42.4	170.9	47.7	123.2
Fire	2.0	1.2	0.8	5.4	4.3	1.1
Beaver	0.4	...	0.4	0.5	...	0.5
Weather	35.6	10.3	25.4	128.2	46.4	81.8
Suppression	8.0	4.4	3.5	1.8	1.1	0.7
Other	2.9	1.6	1.4	3.0	2.7	0.4
All causes	128.8	54.6	74.1	380.2	171.9	208.3

¹ Rows and columns may not sum due to rounding.

² International ¼-inch rule.

Rosson, J.F., Jr.; McWilliams, W.H.; Frey, P.D. 1988. Forest resources of Louisiana. Resour. Bull. SO-130 New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 81 p.

This report presents the principal findings of the fifth forest survey of Louisiana (1984) and changes that have occurred since earlier surveys. Trends in forest area, ownership, forest type, stand structure, stocking, species importance, volume, growth, removals, mortality, management opportunities, and timber products output are discussed.

Additional keywords: forest inventory, forest productivity, tree distribution, basal area.





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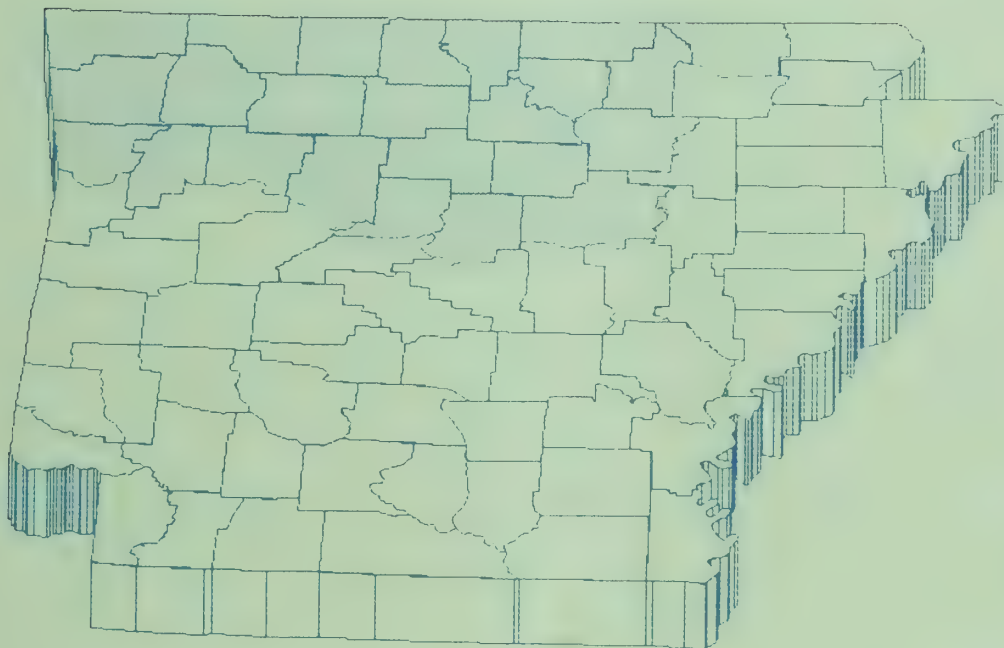
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Forest Statistics for Arkansas' Ozark Counties - 1988

F. Dee Hines



SUMMARY

The 1988 survey of the Ozark Unit in Arkansas showed several changes since the 1978 survey.

- * Timberland area now covers 5729.6 thousand acres, up 10 percent since 1978.
- * Private ownership accounts for 4417.1 thousand acres, up 11 percent.
- * Area covered by loblolly-shortleaf forest type is up 16 percent.
- * Oak-pine forest types showed a 22 percent increase in acreage.
- * Bottomland hardwood forest types increased by 66.2 thousand acres, 48 percent.
- * Sawtimber stands increased 30 percent, poletimber stands increased 26 percent, sapling-seedling stands decreased 29 percent.

- * Plantation acreage is up 74 percent.
- * Softwood volumes have increased; 26 percent for growing stock, 25 percent for sawtimber.
- * Hardwood volumes have increased, 39 percent for growing stock, 54 percent for sawtimber.
- * Softwood growth and removals decreased for both growing stock and sawtimber.
- * Hardwood growth estimates for growing stock and sawtimber are up substantially from the 1978 estimates.
- * Removals of hardwood growing stock have decreased, while removals of hardwood sawtimber have increased.
- * Mortality estimates are up more than 90 percent.

FOREWORD

The Southern Forest Survey, an activity of the Southern Forest Experiment Station Forest Inventory and Analysis work unit, covers the States of Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, Tennessee, and East Texas, and the island of Puerto Rico.

This survey is part of the nationwide Forest Survey originally authorized by the McSweeney-McNary Act of 1928. More recent legislation pertinent to the survey mission includes the Forest and Rangeland Renewable Resources Planning Act of 1974 and the Forest and Rangeland Renewable Resources Research Act of 1978. The survey mission is to develop, analyze, and maintain renewable forest resource information. This information is essential for formulation of forest policies and programs.

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*Core tables are presented in response to the Southern Industrial Forestry Research Council's recommendations. These tables are identical among Forest Inventory and Analysis units in the eastern United States.



Figure I.—The forest survey regions of Arkansas

Forest Statistics for Arkansas' Ozark Counties—1988

F. Dee Hines

INTRODUCTION

Tabulated results were derived from data obtained during a recent inventory of 24 counties comprising the Ozark Unit of Arkansas (fig. 1). Data on forest acreage and timber volume were secured by a three-step process. A forest-nonforest classification using aerial photographs was accomplished for points representing approximately 230 acres. These photo classifications were adjusted based on ground observations at sample locations representing approximately 3,840 acres. Finally, field measurements were made at forest locations on the intersections of grid lines spaced 3 miles apart. At these forest locations, per-acre estimates were obtained from trees measured on ten 37.5 basal area factor prism points.

The sampling methods were designed to achieve suitable sampling errors for estimates of area and volume at the State level. Sampling error increases as the area or volume considered decreases. The sampling errors presented in table I, equal to one standard deviation for the sample data, may be used to construct confidence intervals for population parameters. For example, at the 95 percent confidence level, the confidence interval for growing stock volume (in million cubic feet) in the Ozark region of Arkansas (with a sampling error of 3.1 percent) is

$$4,764.8 \pm 1.96(0.031 \times 4,764.8) = \\ 4,764.8 \pm 289.5$$

where 1.96 is the number of standard deviations. This confidence interval indicates that the actual growing-stock volume lies in the range 4475.3 to 5054.3 million cubic feet, unless a 1 in 20 chance has occurred.

Sampling errors for sub-groups of counties in the unit may be estimated by the following formula:

$$SE_g = \frac{SE_t \sqrt{X_t}}{\sqrt{X_g}}$$

where:

- SE = standard error of estimate
(expressed as a percent)
- X = variable of interest
(area or volume)
- g = group of counties to be combined
- t = total for the unit.

For example, the sampling error estimate of growing-stock volume for Benton, Washington, Madison, and Carroll counties is 7.6 percent. Thus, the 95 percent confidence interval for growing stock volume is 801.3 ± 119.4 million cubic feet.

Ownership information is obtained by the same systematic sample outlined above. County courthouse records are used to obtain ownership information for each forested plot. An expansion factor representing timberland area in that county is then applied to the ownership group the plot represents. Next, the ownership groups are totaled for each county. Thus, acreages reported at the county level are estimates and may not exactly match known totals for each ownership category within that county.

In order to achieve greater compatibility among Forest Inventory and Analysis Projects, a new tree grading classification has been initiated for the 1988 Arkansas Survey. Tree grade 5 is used for trees currently or prospectively capable of producing at least

Table I—Sampling errors¹ for timberland, growing stock, and sawtimber,
Ozark Counties, Arkansas, 1988

County	Timberland	Growing stock			Sawtimber volume
		Volume	Growth	Removals	
----- <i>Percent</i> -----					
Baxter	4.5	11.3	13.7	2.6	13.6
Benton	2.1	17.1	12.7	(2)	21.4
Boone	3.7	17.9	36.1	(2)	24.9
Carroll	3.1	12.0	17.1	19.6	17.7
Cleburne	3.0	10.8	15.4	20.9	15.1
Conway	3.0	17.8	19.0	30.9	22.9
Crawford	2.5	14.0	12.6	30.1	19.0
Faulkner	3.1	14.5	17.1	28.3	20.3
Franklin	2.8	14.9	35.6	21.5	20.0
Fulton	3.7	12.1	19.5	46.8	16.1
Independence	1.9	13.3	15.4	22.4	18.9
Izard	4.5	9.1	10.9	(2)	13.1
Johnson	2.1	11.0	15.5	36.0	14.3
Madison	1.9	11.0	13.3	20.5	14.8
Marion	4.9	13.8	18.2	...	17.7
Newton	1.6	7.9	7.8	30.0	11.4
Pope	1.8	8.8	17.3	25.2	12.4
Randolph	2.1	25.8	24.5	23.1	34.6
Searcy	2.2	9.4	11.4	39.7	13.9
Sharp	2.7	10.5	17.0	30.5	16.8
Stone	2.1	12.4	13.9	19.6	18.8
Van Buren	1.8	11.4	11.6	40.2	13.6
Washington	1.8	11.5	14.1	30.5	16.6
White	1.8	28.3	11.9	27.7	32.2
All counties	0.6	3.1	3.3	6.9	4.3

¹ By random-sampling formula.

² Sampling error greater than 50.

one 12-foot log or two 8-foot logs in the sawlog portion but not able to produce a 12-foot log in the butt 16 feet. These trees, formerly classed as rough or rotten, are now included in growing stock. Table II shows the impact of this change on volume and growth.

Other changes of importance in the 1988 Arkansas Survey include a reclassification of some woodland or reserved timberland to timberland. Moreover, for comparative purposes 1978 survey data were reprocessed using current procedures. Thus, differences between 1978 and 1988 data should reflect resource changes and not data processing differences. Results from the reprocessed 1978 data are used for comparison to 1988 data in the Highlights that follow.

HIGHLIGHTS

Timberland Area

Timberland area in Arkansas' Ozark counties has increased 10 percent since the 1978 survey. With 5729.6 thousand acres of timberland, the area is now 58 percent forested. Five percent of this increase is due to the reclassification already mentioned, while the remainder is due to additions from pasture and cropland.

The vast majority of timberland in this unit is in private ownership. This ownership group showed an 11 percent increase up to 4417.1 thousand acres. Forest industry-owned land, including that under long term

Table II—Changes in volume and growth estimates due to inclusion of tree grade 5 in growing-stock inventory, Ozark Counties, Arkansas, 1988

	Tree grade 5		
	Excluded from growing stock	Included in growing stock	Percent change
----- Million cubic feet -----			
Softwood:			
Growing-stock volume	870.7	887.2	1.9
Rough and Rotten volume	42.6	26.1	-38.7
Growing-stock growth	34.2	36.2	5.8
Hardwood:			
Growing-stock volume	3630.9	3877.6	6.8
Rough and Rotten volume	770.8	524.1	-32.0
Growing-stock growth	127.9	157.9	23.5
----- Million board feet -----			
Softwood:			
Sawtimber volume	3038.1	3073.7	1.2
Sawtimber growth	137.0	141.0	2.9
Hardwood:			
Sawtimber volume	9599.8	10577.7	10.2
Sawtimber growth	442.9	563.2	27.2

lease, is up to 175.8 thousand acres from 115.7 thousand acres. This is a 52 percent increase over the 1978 level. Other ownership categories remained fairly constant although land in the other public ownership group is up slightly, increasing about 11 thousand acres.

All forest types show an increase in acreage over the previous survey. The loblolly-shortleaf type is up 16 percent to 502.9 thousand acres. Oak-pine forest lands increased from 632.6 thousand acres to 771.2 thousand acres or 22 percent. The dominant oak-hickory forest type now covers 4252.4 thousand acres in Northwest Arkansas, showing a 6 percent increase. The most dramatic jump however, is in the bottomland hardwood types up 66.2 thousand acres. Bottomland hardwoods now cover 203.1 thousand acres. Both oak-gum-cypress and elm-ash-cottonwood forest types are included in the bottomland hardwood type.

Changes in stand-size class acreage indicate a shift towards stands of larger trees. Sawtimber and poletimber stands are up 30

percent and 26 percent respectively. Sawtimber stands now cover 1705.5 thousand acres. Poletimber stands, accounting for 48 percent of timberland in Arkansas' Ozark region, are up 564.4 thousand acres to 2774.7 thousand acres. Sapling-seedling stands are down 29 percent to 1173.6 thousand acres despite a 74 percent increase in plantation acreage. Plantations now cover 156.8 thousand acres.

Number of Trees

The number of live trees has changed very little, up only .6 percent since the 1978 survey. A slight decrease in the number of live hardwood trees, down 1 percent, is offset by the 11 percent increase in live softwood trees. This decrease in live hardwood trees occurs entirely in the 2-inch and 4-inch diameter classes. The 2-inch class is down 5 percent and the 4-inch class is down 3 percent. All other diameter classes in hardwood live trees showed increases over 1978 numbers. The increase in softwood live trees is

spread across all diameter classes although it is more pronounced in the larger diameter trees.

The total number of growing-stock trees is down 35 percent from the previous survey. Most of this decrease is due to a 42 percent loss in hardwood growing stock. Again, only the 2-inch and 4-inch diameter classes showed any decrease with a 67 percent and 29 percent decrease respectively. As with all live trees, the total number of softwood growing-stock trees increased, but only 2 percent. However, here as with the hardwood growing-stock trees the smallest two classes showed decreases. Nevertheless, most of the total decline in growing-stock trees is due to a sharp decrease in small diameter hardwood growing-stock trees.

Timber Volume

Softwood volumes have increased since the previous inventory. The 1978 survey reflected a 20 percent rise in softwood growing-stock volume over past levels with 704.6 million cubic feet. Softwood growing-stock volume in the region has continued this trend up another 26 percent since 1978. The current inventory of softwood growing-stock volume is 887.2 million cubic feet. Softwood sawtimber volumes follow a similar pattern, up 25 percent between 1969 and 1978 and up another 32 percent for the current survey. The 1978 inventory of 2330.8 million board feet has increased to 3073.7 million board feet.

Similarly, hardwood volumes are up over 1978 levels. Hardwood growing-stock volume was 2785.4 million cubic feet but is now up to 3877.6 million cubic feet. This jump of 39 percent is contrary to the 6 percent drop occurring in the previous survey cycle. The same trend is seen for hardwood sawtimber volume. In 1978 hardwood sawtimber volume was 6869.6 million board feet, 54 percent less than the 10577.7 million board feet estimated for the current survey. Conversely, hardwood sawtimber volume in 1978 was down 5 percent from the 1969 inventory report.

Growth, Removals, and Mortality

Average net annual growth of growing stock is up 57 percent for the unit total. This increase, however, is due to hardwood growth since net annual growth of softwood growing stock decreased 8 percent from 39.2 million cubic feet to 36.2 million cubic feet. Hardwood net annual growth of growing stock showed a substantial increase from 84.8 million cubic feet to 157.9 million cubic feet.

A similar pattern is seen for net annual growth of sawtimber with a small decrease of less than 1 percent in softwood growth to 141.0 million board feet, and a jump of 350.1 million board feet in hardwood growth.

Softwood removals are down since the previous survey. Removals of softwood growing stock decreased slightly from 19.3 million cubic feet to 18.7 million cubic feet. Again, removals of softwood sawtimber decreased by 9 percent, a drop of 5.7 million board feet.

Removals from hardwood growing stock are down but removals from sawtimber showed a moderate increase. Hardwood growing stock removals decreased from 50.3 million cubic feet in 1978 to 43.6 million cubic feet currently. Hardwood sawtimber removals increased 15 percent to their current level of 131.0 million board feet.

Overall, net annual growth far exceeds average annual removals in both growing-stock volume and sawtimber volume for both softwoods and hardwoods.

Mortality totals for the Ozark region showed a sharp increase over 1978 figures. The current survey shows total mortality of growing stock to be 32.4 million cubic feet, which is a 91 percent increase over the 17.0 million cubic feet calculated for 1978. Sawtimber mortality is also up over 90 percent from 37.7 million board feet to 73.4 million board feet.

Tables 1-25 were developed to provide compatibility among Forest Inventory and Analysis Projects. Tables 26-36 are supplementary tables and may change from unit to unit or State to State to address specific resource issues.

DEFINITION OF TERMS

Average net annual growth.—Average net annual volume increase for the inter-survey period.

Average annual mortality.—Average annual sound-wood volume of growing-stock trees dying from natural causes.

Average annual removals.—Average net annual volume of growing-stock trees removed from the inventory by harvesting, cultural operations (such as timber-stand improvement), land clearing, or changes in land use.

Commercial species.—Tree species which normally develop into trees suitable for industrial wood products.

Forest type.—A classification of forest land based upon the species forming a plurality of live-tree stocking.

Growing-stock trees.—Live trees of commercial species. Rough and rotten trees are excluded.

Growing-stock volume.—The cubic-foot volume of sound wood in growing-stock trees at least 5.0 inches in diameter at breast height, from a 1-foot stump to a minimum 4.0-inch top diameter outside bark of the central stem, or to the point where the central stem breaks into limbs.

Live trees.—Commercial and non-commercial tree species of sapling size or larger.

Natural stands.—Stands with no evidence of artificial regeneration. This includes those stands established by seed tree regeneration methods.

Noncommercial species.—Tree species of typically small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products.

Planted stands.—Stands with some evidence of planting or direct seeding.

Poletimber trees.—Growing-stock trees at least 5.0 inches in diameter at breast height, but smaller than sawtimber size.

Reserved timberland.—Productive public forest land withdrawn from timber utiliza-

tion through statute or administrative regulations.

Rotten trees.—Live trees of commercial species that do not contain at least one 12-foot log or two 8-foot logs in the saw-log portion, now or prospectively, primarily because of rot.

Rough trees.—Live trees of commercial species that do not contain at least one 12-foot log or two 8-foot logs in the saw-log portion, now or prospectively, primarily because of roughness or poor form. Also included are all live trees of noncommercial species.

Saplings.—Growing-stock trees at least 1.0 inches but less than 5.0 inches in diameter at breast height.

Sawtimber trees.—Live trees that contain at least one 12-foot log, or two 8-foot logs in the saw-log portion, and meet regional specifications for freedom from defect. Softwoods must be at least 9.0 inches in diameter at breast height and hardwoods at least 11.0 inches in diameter at breast height.

Sawtimber volume.—Sound-wood volume of the saw-log portion of growing-stock sawtimber trees in board feet, International 1/4-inch rule and in cubic feet.

Seedlings.—Growing-stock trees less than 1.0 inches in diameter at breast height and greater than one foot tall for hardwoods, greater than six inches tall for softwoods, and greater than one-half inch in diameter at ground level for longleaf pine.

Select white oaks.—A classification of several white oak species composed of: white, swamp chestnut, swamp white, chinkapin, Durand, and bur oaks.

Select red oaks.—A classification of several red oak species composed of: cherrybark, Shumard, and northern red oaks.

Site class.—A classification of forest land in terms of inherent capacity to grow crops of industrial wood.

Stand-size class.—A classification of forest land based on the diameter size class of growing-stock trees on the sampled area; that is, sawtimber, poletimber, or sapling and seedling.

Timberland.—Forest land that is producing, or is capable of producing, crops of industrial wood and not withdrawn from timber utilization. Timberland is synonymous with “commercial forest land” in prior reports.

Tree grade.—A classification of the volume of the saw-log portion of sawtimber trees

based on: 1) the log grade of the butt log, or 2) ability to produce at least one 12-foot log or two 8-foot logs in the upper-section of the saw-log portion.

Woodland.—Forest land incapable of yielding crops of industrial wood because of adverse site conditions.

Core Tables 1–25

Table 1—Area by county and land class, Ozark Counties, Arkansas, 1988

County	All land ¹	Forest land			Reserved timberland	Nonforest land
		Total	Timberland ²	Woodland ³		
----- Thousand acres -----						
Baxter	349.3	255.5	209.2	31.7	14.6	93.8
Benton	539.8	218.8	210.7	5.7	2.4	321.1
Boone	373.7	144.0	126.7	17.3	...	229.7
Carroll	405.7	205.6	183.3	22.2	...	200.2
Cleburne	352.3	226.5	226.5	...	...	125.8
Conway	357.4	163.9	163.9	...	...	193.5
Crawford	379.9	218.2	211.6	6.6	...	161.7
Faulkner	413.1	168.4	168.4	...	...	244.7
Franklin	389.6	231.2	231.2	...	...	158.3
Fulton	394.3	206.7	189.9	16.8	...	187.6
Independence	488.6	193.0	187.3	5.7	...	295.6
Izard	372.0	244.7	207.1	37.6	...	127.3
Johnson	432.4	290.9	285.2	...	5.7	141.4
Madison	536.0	382.3	376.2	6.2	...	153.6
Marion	375.8	263.3	196.5	41.7	25.2	112.4
Newton	526.7	450.2	377.3	5.6	67.3	76.5
Pope	524.8	365.1	353.7	...	11.4	159.7
Randolph	419.8	176.6	176.6	...	...	243.2
Searcy	427.5	314.9	285.5	5.8	23.6	112.6
Sharp	387.9	230.6	219.3	11.2	...	157.4
Stone	387.8	314.7	309.0	5.7	...	73.1
Van Buren	454.0	345.9	345.9	...	...	108.1
Washington	608.5	264.0	259.0	5.0	...	344.5
White	665.7	229.5	229.5	...	...	436.2
All counties	10562.6	6104.6	5729.6	224.8	150.2	4458.0

¹ From U.S. Bureau of the Census.

² Forest land (formerly termed commercial forest land) that is producing or capable of producing at least 20 cubic feet of industrial wood per acre per year. Includes areas which may be inaccessible or inoperable by current standards. Excludes reserved timberlands.

³ Forest land incapable of producing 20 cubic feet of industrial wood per acre per year under natural conditions because of adverse site conditions.

Table 2—Area of timberland by county and ownership class, Ozark Counties, Arkansas, 1988

County	All ownerships	National forest	Misc. federal	State	County and municipal	Forest industry ¹	Farmer	Corporate ²	Individual ²
----- Thousand acres -----									
Baxter	209.2	50.7	19.0	6.3	...	...	57.1	...	76.1
Benton	210.7	11.4	11.4	11.4	...	...	62.6	62.6	51.2
Boone	126.7	...	...	...	...	...	57.6	11.5	57.6
Carroll	183.3	...	...	...	...	...	61.1	22.2	100.0
Cleburne	226.5	...	...	...	...	35.2	45.3	10.1	135.9
Conway	163.9	...	...	7.1	...	14.2	42.7	7.1	92.6
Crawford	211.6	79.4	...	...	...	...	39.7	6.6	86.0
Faulkner	168.4	...	9.4	4.7	...	...	18.7	51.5	84.2
Franklin	231.2	85.9	6.6	...	...	...	66.1	6.6	66.1
Fulton	189.9	...	...	...	...	5.6	106.1	11.2	67.0
Independence	187.3	...	...	...	...	28.4	68.1	34.1	56.8
Izard	207.1	...	...	...	...	...	31.4	12.6	163.2
Johnson	285.2	173.2	5.1	...	...	...	20.4	...	86.6
Madison	376.2	37.0	...	6.2	...	...	154.2	6.2	172.7
Marion	196.5	...	...	...	...	...	95.3	6.0	95.3
Newton	377.3	152.0	...	5.6	...	...	61.9	5.6	152.0
Pope	353.7	202.1	...	5.6	...	11.2	44.9	5.6	84.2
Randolph	176.6	...	...	7.1	...	7.1	49.4	7.1	106.0
Searcy	285.5	40.8	...	5.8	...	...	116.5	5.8	116.5
Sharp	219.3	...	5.6	16.9	...	...	45.0	16.9	135.0
Stone	309.0	68.7	...	...	...	22.9	62.9	11.4	143.1
Van Buren	345.9	33.5	...	5.6	...	44.6	139.5	5.6	117.2
Washington	259.0	29.9	...	...	...	...	69.7	14.9	144.5
White	229.5	...	...	32.8	...	6.6	72.1	6.6	111.4
All counties	5729.6	964.5	57.1	115.1	...	175.8	1588.4	327.7	2501.0

¹ Includes land leased to forest industry.² Indian land will be classed as corporate or individual as defined by the Bureau of Indian Affairs.

Table 3—Area of timberland by county and forest type group, Ozark Counties, Arkansas, 1988

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum cypress	Elm-ash- cottonwood
		Planted	Natural				
----- Thousand acres -----							
Baxter	209.2	6.3	6.3	31.7	164.8	...	...
Benton	210.7	...	5.7	5.7	193.6	...	5.7
Boone	126.7	...	...	11.5	115.2	...	...
Carroll	183.3	...	...	27.8	155.6	...	...
Cleburne	226.5	10.1	35.2	55.4	120.8	5.0	...
Conway	163.9	...	21.4	42.7	78.4	21.4	...
Crawford	211.6	6.6	6.6	59.5	132.3	6.6	...
Faulkner	168.4	9.4	...	18.7	116.9	23.4	...
Franklin	231.2	...	33.0	33.0	158.6	6.6	...
Fulton	189.9	5.6	5.6	11.2	167.6	...	...
Independence	187.3	...	22.7	28.4	130.6	5.7	...
Izard	207.1	...	31.4	50.2	119.2	6.3	...
Johnson	285.2	15.3	40.7	45.8	183.3	...	...
Madison	376.2	...	6.2	30.8	339.2	...	...
Marion	196.5	...	11.9	6.0	172.6	6.0	...
Newton	377.3	...	16.9	33.8	326.6	...	...
Pope	353.7	5.6	61.8	67.4	207.7	11.2	...
Randolph	176.6	...	7.1	7.1	134.2	28.3	...
Searcy	285.5	...	5.8	17.5	256.4	5.8	...
Sharp	219.3	...	11.2	28.1	174.3	5.6	...
Stone	309.0	5.7	17.2	62.9	223.2	...	...
Van Buren	345.9	22.3	44.6	61.4	217.6	...	...
Washington	259.0	...	5.0	14.9	239.1	...	...
White	229.5	...	19.7	19.7	124.6	65.6	...
All counties	5729.6	86.9	416.0	771.2	4252.4	197.4	5.7

**Table 4—Area of timberland by county and stand-size class,
Ozark Counties, Arkansas, 1988**

County	All classes	Stand-size class		Sapling- seedling	Nonstocked ¹ areas
		Sawtimber	Poletimber		
-----Thousand acres-----					
Baxter	209.2	76.1	95.1	38.0	...
Benton	210.7	79.7	79.7	51.2	...
Boone	126.7	57.6	34.6	34.6	...
Carroll	183.3	77.8	72.2	33.3	...
Cleburne	226.5	60.4	105.7	60.4	...
Conway	163.9	42.7	71.2	49.9	...
Crawford	211.6	92.6	112.4	6.6	...
Faulkner	168.4	18.7	84.2	65.5	...
Franklin	231.2	66.1	105.7	39.6	19.8
Fulton	189.9	16.8	95.0	72.6	5.6
Independence	187.3	90.8	62.4	34.1	...
Isard	207.1	56.5	100.4	50.2	...
Johnson	285.2	112.0	137.5	35.7	...
Madison	376.2	123.3	154.2	92.5	6.2
Marion	196.5	59.5	71.4	59.5	6.0
Newton	377.3	123.9	208.3	39.4	5.6
Pope	353.7	129.1	179.7	39.3	5.6
Randolph	176.6	49.4	63.6	63.6	...
Searcy	285.5	75.7	163.2	40.8	5.8
Sharp	219.3	22.5	112.5	73.1	11.2
Stone	309.0	85.8	177.4	45.8	...
Van Buren	345.9	61.4	228.7	55.8	...
Washington	259.0	54.8	174.3	19.9	10.0
White	229.5	72.1	85.2	72.1	...
All counties	5729.6	1705.5	2774.7	1173.6	75.8

¹ Timberland less than 16.7 percent stocked.

**Table 5—Area of timberland by county and site class,
Ozark Counties, Arkansas, 1988**

County	All classes	Site class (cubic feet/acre/year)				
		>165	120-165	85-120	50-85	<50
----- <i>Thousand acres</i> -----						
Baxter	209.2	...	6.3	...	95.1	107.8
Benton	210.7	...	11.4	5.7	136.6	56.9
Boone	126.7	...	...	...	69.1	57.6
Carroll	183.3	...	...	5.6	88.9	88.9
Cleburne	226.5	...	5.0	20.1	166.1	35.2
Conway	163.9	...	7.1	42.7	85.5	28.5
Crawford	211.6	...	...	13.2	125.7	72.7
Faulkner	168.4	...	18.7	14.0	70.2	65.5
Franklin	231.2	...	13.2	26.4	132.1	59.5
Fulton	189.9	...	...	11.2	72.6	106.1
Independence	187.3	...	...	5.7	130.6	51.1
Izard	207.1	...	...	43.9	100.4	62.8
Johnson	285.2	...	...	35.7	173.2	76.4
Madison	376.2	...	...	6.2	197.3	172.7
Marion	196.5	...	...	...	95.3	101.2
Newton	377.3	...	...	5.6	191.5	180.2
Pope	353.7	...	16.8	73.0	202.1	61.8
Randolph	176.6	7.1	7.1	14.1	63.6	84.8
Searcy	285.5	...	...	17.5	163.2	104.9
Sharp	219.3	...	...	16.9	95.6	106.9
Stone	309.0	...	...	17.2	228.9	62.9
Van Buren	345.9	...	...	22.3	223.1	100.4
Washington	259.0	...	...	...	124.5	134.5
White	229.5	...	26.2	52.4	98.3	52.4
All counties	5729.6	7.1	111.9	449.4	3129.5	2031.7

Table 6—Area of timberland by county and stocking classes of growing-stock trees, Ozark Counties, Arkansas, 1988

County	All classes	Stocking class (percent)				
		>130	100-130	60-100	16.7-60	<16.7
----- <i>Thousand acres</i> -----						
Baxter	209.2	6.3	12.7	126.8	63.4	...
Benton	210.7	...	17.1	113.9	79.7	...
Boone	126.7	...	...	74.9	51.8	...
Carroll	183.3	...	11.1	77.8	94.5	...
Cleburne	226.5	10.1	45.3	135.9	35.2	...
Conway	163.9	...	35.6	64.1	64.1	...
Crawford	211.6	...	13.2	132.3	66.1	...
Faulkner	168.4	...	18.7	88.9	60.8	...
Franklin	231.2	...	13.2	151.9	46.2	19.8
Fulton	189.9	5.6	11.2	83.8	83.8	5.6
Independence	187.3	...	5.7	141.9	39.7	...
Izard	207.1	12.6	6.3	144.3	43.9	...
Johnson	285.2	5.1	45.8	183.3	50.9	...
Madison	376.2	...	24.7	234.3	111.0	6.2
Marion	196.5	...	17.9	101.2	71.4	6.0
Newton	377.3	...	50.7	202.7	118.3	5.6
Pope	353.7	11.2	44.9	230.2	61.8	5.6
Randolph	176.6	...	...	77.7	98.9	...
Searcy	285.5	...	17.5	151.5	110.7	5.8
Sharp	219.3	...	16.9	101.2	90.0	11.2
Stone	309.0	...	40.1	188.8	80.1	...
Van Buren	345.9	...	16.7	251.0	78.1	...
Washington	259.0	...	14.9	114.6	119.5	10.0
White	229.5	13.1	13.1	157.3	45.9	...
All counties	5729.6	64.0	493.2	3330.5	1766.0	75.8

Table 7—Area of timberland by forest type and ownership class, Ozark Counties, Arkansas, 1988

Forest type ¹	All ownerships	National forest	Other public	Forest industry	Forest industry-leased	Other private
----- Thousand acres -----						
Loblolly-shortleaf pine	502.9	122.8	17.8	60.0	...	302.3
Softwood total	502.9	122.8	17.8	60.0	...	302.3
Oak-pine	771.2	103.8	17.5	40.7	...	609.2
Oak-hickory	4252.4	737.9	86.7	75.1	...	3352.7
Oak-gum-cypress	197.4	...	44.5	...	...	152.9
Elm-ash-cottonwood	5.7	...	5.7	...	...	...
Hardwood total	5226.7	841.7	154.4	115.8	...	4114.8
All types	5729.6	964.5	172.1	175.8	...	4417.1

¹ Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

Table 8—Area of timberland by ownership and stocking classes of growing-stock trees, Ozark Counties, Arkansas, 1988

Ownership class	All classes	Stocking class (percent)				
		>130	100-130	60-100	16.7-60	<16.7
----- <i>Thousand acres</i> -----						
National forest	964.5	10.7	132.6	676.5	144.6	...
Other public	172.1	...	...	113.3	52.2	6.6
Forest industry	175.8	5.0	22.2	113.2	35.4	...
Other private	4417.1	48.2	338.4	2427.5	1533.8	69.2
All ownerships	5729.6	64.0	493.2	3330.5	1766.0	75.8

Table 9—Area of timberland by forest type and stand-size class, Ozark Counties, Arkansas, 1988

Forest type ¹	All classes	Stand-size class			Nonstocked ² areas
		Sawtimber	Poletimber	Sapling- seedling	
		----- <i>Thousand acres</i> -----			
Loblolly-shortleaf pine	502.9	234.2	160.6	108.1	...
Softwood total	502.9	234.2	160.6	108.1	...
Oak-pine	771.2	205.8	349.7	215.7	...
Oak-hickory	4252.4	1165.1	2193.5	830.2	63.6
Oak-gum-cypress	197.4	100.4	65.2	19.6	12.2
Elm-ash-cottonwood	5.7	...	5.7	...	...
Hardwood total	5226.7	1471.3	2614.1	1065.5	75.8
All types	5729.6	1705.5	2774.7	1173.6	75.8

¹ Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

² Timberland less than 16.7 percent stocked.

Table 10—Number of live trees on timberland by species and diameter class, Ozark Counties, Arkansas, 1988

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----													
Shortleaf-loblolly pine	256943	106749	62880	30425	25706	14082	9391	4693	1810	831	274	103	...
Cypress	1512	601	601	134	...	...	...	47	36	13	44	33	4
Other softwoods	255568	159191	59890	19577	11156	3303	1587	598	196	55	...	15	...
Total softwoods	514024	266541	123371	50135	36863	17384	10978	5338	2041	899	317	151	4
Select white oaks	324041	124165	74915	49039	32801	19355	10323	6819	3082	1717	906	870	48
Select red oaks	104386	41450	15939	13743	10709	7815	5583	3913	2302	1344	788	749	51
Other white oaks	274144	111260	74703	35623	22151	12953	7227	4344	2806	1321	746	993	17
Other red oaks	281990	142954	48578	27712	22298	13885	10226	6495	4359	2394	1418	1538	132
Hickory	561743	326744	113710	63789	29563	15012	6774	3635	1520	494	269	212	21
Hard maple	61497	39253	13906	2482	3117	1406	564	367	192	109	57	45	...
Soft maple	119916	91748	19136	5150	1608	1104	556	260	144	81	86	42	...
Beech	10776	7646	1500	535	186	109	191	111	141	120	94	145	...
Sweetgum	65131	27656	15434	10260	4696	2395	2003	1216	672	406	194	189	10
Tupelo-blackgum	147054	103255	22697	8021	5325	2311	1638	1214	1209	578	278	469	60
Ash	61918	40358	11061	4385	2290	1373	982	562	372	192	147	164	32
Cottonwood-aspen	42	...	...	...	...	...	...	...	18	...	12	12	...
Basswood	3840	2590	511	104	163	91	203	85	42	12	21	17	...
Yellow-poplar	46	...	...	...	...	...	27	19	...	...	...	...	...
Black walnut	8633	2125	2573	1309	1186	720	334	119	129	85	19	35	...
Other hardwoods	810322	634246	124897	29687	10787	5725	2074	1271	704	447	234	230	20
Total hardwoods	2835478	1695450	539560	251839	146879	84254	48706	30430	17692	9300	5267	5711	391
Noncommercial	287884	226856	38272	11744	5687	2549	1195	825	477	152	88	40	...
All species	3637386	2188847	701204	313718	189428	104187	60879	36593	20210	10351	5672	5902	394

Table 11—Number of growing-stock trees on timberland by species and diameter class, Ozark Counties, Arkansas, 1988

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----													
Shortleaf-loblolly pine	218747	79341	54235	29018	25426	13804	9302	4648	1793	819	274	88	...
Cypress	276	...	...	134	...	...	...	27	36	13	32	33	1
Other softwoods	200533	123328	46031	17208	9675	2340	1273	463	163	44	...	7	...
Total softwoods	419556	202669	100266	46360	35101	16144	10575	5138	1992	876	306	128	1
Select white oaks	204794	40981	52065	43901	30145	18199	8763	5688	2536	1265	671	550	29
Select red oaks	61729	9757	11725	12026	9355	6932	4608	3338	1829	1044	614	476	26
Other white oaks	145930	26354	46927	30345	19282	11129	5053	3076	1912	755	538	547	12
Other red oaks	185694	68359	35969	24587	21267	12936	8707	5705	3774	2047	1161	1105	76
Hickory	255483	88480	66874	51403	25673	12900	5197	2887	1252	415	230	151	21
Hard maple	24613	7952	9987	2030	2469	1266	389	283	126	60	24	28	...
Soft maple	27758	15925	6109	3536	919	669	253	177	56	40	55	19	...
Beech	5684	3048	1500	535	186	109	26	37	56	72	48	69	...
Sweetgum	38842	10425	8627	8958	4283	2306	1770	1095	659	392	174	142	10
Tupelo-blackgum	51602	23110	12485	6004	4332	2004	1153	728	827	410	178	323	48
Ash	16759	4181	5336	2893	1580	928	657	498	197	181	128	148	32
Cottonwood-aspen	42	...	...	...	...	...	...	...	18	...	12	12	...
Basswood	2089	992	511	...	163	91	181	85	28	12	9	17	...
Yellow-poplar	46	...	...	...	...	...	27	19	...	...	...	...	...
Black walnut	3726	521	522	838	959	457	197	60	97	61	9	5	...
Other hardwoods	193530	118370	45276	15082	7394	4075	1264	890	483	331	181	165	20
Total hardwoods	1218321	418455	303912	202138	128008	73998	38243	24567	13850	7084	4032	3759	275
All species	1637878	621125	404178	248498	163109	90142	48818	29704	15842	7960	4338	3888	276

Table 12—Volume of growing stock on timberland by species and diameter class, Ozark Counties, Arkansas, 1988

Species	Diameter class (inches at breast height)										
	All classes	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
-----Million cubic feet-----											
Shortleaf-loblolly pine	759.6	63.4	143.0	150.7	158.7	116.6	65.7	40.3	15.0	6.2	...
Cypress	6.7	0.3	...	...	...	0.8	0.9	0.2	1.8	1.4	1.3
Other softwoods	120.9	35.8	39.6	18.2	15.2	7.4	3.2	1.1	...	0.3	...
Total softwoods	887.2	99.6	182.6	168.9	173.9	124.8	69.8	41.6	16.8	7.9	1.3
Select white oaks	902.8	114.8	173.7	181.8	134.5	119.7	71.6	45.5	29.4	29.3	2.6
Select red oaks	449.6	31.9	53.6	68.9	71.4	70.6	52.3	39.2	28.2	31.3	2.2
Other white oaks	453.7	61.8	84.4	86.0	61.4	49.9	41.3	21.2	18.5	27.7	1.4
Other red oaks	812.1	52.9	107.2	117.1	122.9	111.4	103.8	73.1	49.3	66.4	8.0
Hickory	533.9	96.3	110.7	110.8	74.3	62.2	35.4	18.1	12.2	10.7	3.3
Hard maple	49.2	4.6	12.5	12.3	5.2	5.9	4.1	1.9	1.1	1.6	...
Soft maple	33.9	9.1	4.6	5.7	3.6	3.9	1.7	2.2	2.2	0.9	...
Beech	16.9	1.2	0.8	1.5	0.3	1.1	1.8	3.7	2.1	4.5	...
Sweetgum	185.0	18.2	23.1	22.9	30.5	27.5	22.9	17.0	10.1	11.0	1.8
Tupelo-blackgum	153.2	12.9	21.2	18.1	16.4	16.3	22.2	15.5	7.4	18.6	4.7
Ash	70.5	6.1	8.2	8.2	8.1	9.4	5.4	6.8	4.7	9.4	4.2
Cottonwood-aspen	2.6	...	...	...	...	...	0.8	...	0.6	1.1	...
Basswood	11.5	...	0.7	1.0	2.9	2.0	1.1	0.7	0.6	2.5	...
Yellow-poplar	1.0	...	...	...	0.5	0.5	...	...	...	...	...
Black walnut	19.8	1.6	4.3	4.5	2.9	1.3	2.7	2.0	0.4	0.2	...
Other hardwoods	181.9	29.7	33.9	35.4	19.4	18.4	14.2	11.3	7.2	10.1	2.3
Total hardwoods	3877.6	441.1	638.9	674.0	554.6	500.2	381.2	258.1	173.9	225.2	30.6
All species	4764.8	540.6	821.4	842.9	728.5	625.0	451.0	299.7	190.7	233.1	31.9

Table 13—Volume of growing stock in the saw-log portion of sawtimber¹ trees on timberland by species and diameter class, Ozark Counties, Arkansas, 1988

Species	All classes	Diameter class (inches at breast height)							
		9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Million cubic feet-----									
Shortleaf-loblolly pine	483.3	124.2	140.2	102.9	59.8	37.0	13.3	5.9	...
Cypress	6.1	...	...	0.7	0.8	0.2	1.7	1.4	1.3
Other softwoods	38.0	14.7	13.1	6.5	2.5	1.0	...	0.2	...
Total softwoods	527.4	138.9	153.3	110.1	63.0	38.2	15.0	7.5	1.3
Select white oaks	358.8	...	103.4	100.8	61.3	40.1	26.2	24.6	2.4
Select red oaks	249.5	...	55.7	59.9	45.2	34.5	24.8	27.3	2.2
Other white oaks	188.8	...	49.9	42.7	35.8	18.2	16.2	24.6	1.4
Other red oaks	451.8	...	95.8	94.2	90.4	63.8	42.9	57.3	7.4
Hickory	180.3	...	58.2	52.9	29.8	16.2	10.7	9.4	3.2
Hard maple	16.0	...	4.1	4.5	3.6	1.6	0.9	1.2	...
Soft maple	11.8	...	2.6	3.3	1.3	1.9	1.9	0.8	...
Beech	11.7	...	0.2	0.9	1.7	3.1	1.7	4.0	...
Sweetgum	100.9	...	21.7	22.6	19.9	15.7	9.2	10.2	1.8
Tupelo-blackgum	88.3	...	11.9	13.5	20.2	14.0	6.9	17.3	4.5
Ash	40.8	...	6.2	7.8	4.6	6.0	4.2	8.5	3.6
Cottonwood-aspen	2.2	...	...	...	0.6	...	0.6	1.1	...
Basswood	8.6	...	2.4	1.7	1.1	0.6	0.5	2.3	...
Yellow-poplar	0.7	...	0.4	0.3	...	...	...	...	...
Black walnut	7.5	...	2.1	1.1	2.0	1.8	0.3	0.2	...
Other hardwoods	68.9	...	14.0	15.1	12.4	10.1	6.0	9.1	2.2
Total hardwoods	1786.7	...	428.6	421.2	329.8	227.4	153.0	198.0	28.8
All species	2314.1	138.9	581.9	531.3	392.8	265.7	168.0	205.5	30.1

¹ That part of the bole of sawtimber trees between a 1-foot stump and saw-log top, including the portion of the forks large enough to contain a saw log.

**Table 14—Volume of sawtimber on timberland by species and diameter class,
Ozark Counties, Arkansas, 1988**

Species	All classes	Diameter class (inches at breast height)							
		9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Million board feet-----									
Shortleaf-loblolly pine	2845.3	656.1	797.8	629.4	384.7	248.2	89.5	39.5	...
Cypress	32.6	...	...	4.0	3.3	0.8	10.0	4.2	10.3
Other softwoods	195.7	71.4	66.9	35.6	14.8	5.6	...	1.5	...
Total softwoods	3073.7	727.5	864.7	669.0	402.8	254.7	99.4	45.2	10.3
Select white oaks	2116.6	...	566.3	586.0	375.7	252.1	165.3	158.4	13.0
Select red oaks	1512.1	...	308.5	349.3	275.2	219.9	158.6	177.7	22.8
Other white oaks	1105.4	...	264.1	243.3	210.7	113.2	105.8	160.4	7.9
Other red oaks	2660.2	...	512.5	530.4	540.3	394.1	270.1	364.5	48.3
Hickory	1080.6	...	322.2	312.4	182.6	106.0	71.9	63.0	22.4
Hard maple	99.7	...	23.0	27.1	23.3	10.9	6.2	9.1	...
Soft maple	71.6	...	15.7	19.7	8.0	12.5	11.2	4.4	...
Beech	79.4	...	1.3	5.3	10.6	20.9	13.2	28.0	...
Sweetgum	602.7	...	123.3	130.8	119.0	96.2	55.0	67.1	11.3
Tupelo-blackgum	507.9	...	63.3	77.9	116.6	83.9	44.1	100.7	21.5
Ash	227.9	...	32.9	43.6	27.1	36.6	22.9	43.9	20.8
Cottonwood-aspen	13.0	...	...	...	3.6	...	3.2	6.2	...
Basswood	54.1	...	14.2	9.9	6.9	3.8	3.1	16.2	...
Yellow-poplar	4.0	...	2.2	1.9	...	...	...	...	...
Black walnut	43.6	...	11.1	6.4	12.4	10.7	2.2	0.8	...
Other hardwoods	399.0	...	77.2	87.7	72.9	61.7	35.6	51.9	11.8
Total hardwoods	10577.7	...	2337.5	2431.8	1984.9	1422.7	968.5	1252.5	179.8
All species	13651.4	727.5	3202.2	3100.8	2387.7	1677.3	1068.0	1297.8	190.1

**Table 15—Volume of growing stock and sawtimber on timberland by county and species group,
Ozark Counties, Arkansas, 1988**

County	Growing stock						Sawtimber					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
-----Million cubic feet-----						-----Million board feet-----						
Baxter	171.7	12.1	8.9	6.4	10.2	134.0	554.1	38.8	36.7	12.8	23.1	442.6
Benton	182.1	...	1.9	1.2	13.9	165.2	569.4	...	10.8	4.3	33.1	521.2
Boone	93.5	...	0.9	1.4	1.7	89.6	275.1	...	4.3	1.3	1.7	267.9
Carroll	122.3	...	9.4	1.5	4.0	107.5	364.8	...	36.9	...	10.2	317.7
Cleburne	179.6	12.4	61.3	5.0	20.5	80.4	456.8	50.9	223.8	10.5	53.7	117.9
Conway	116.7	1.2	30.7	8.3	30.6	46.0	325.6	...	94.2	27.2	103.8	100.4
Crawford	230.9	4.9	26.7	10.6	38.7	150.0	730.0	...	144.4	22.6	122.6	440.4
Faulkner	96.5	5.0	3.5	3.8	20.6	63.6	240.4	4.6	11.9	4.7	48.1	171.1
Franklin	207.1	6.0	31.9	5.6	33.6	129.9	611.1	15.6	127.0	5.8	91.5	371.1
Fulton	97.5	21.0	0.2	0.9	3.3	72.2	218.0	49.8	...	1.4	6.2	160.6
Independence	150.1	...	29.0	3.8	16.9	100.5	439.3	...	78.3	5.2	55.2	300.7
Izard	155.5	...	53.7	5.8	8.2	87.8	391.6	...	156.8	7.3	23.7	203.7
Johnson	326.9	27.9	68.7	4.9	44.5	180.9	1121.6	151.7	269.9	15.0	156.2	528.8
Madison	310.7	...	10.1	2.5	31.9	266.2	907.8	...	47.9	4.4	109.8	745.7
Marion	118.4	...	7.9	7.0	3.0	100.5	357.3	...	32.5	3.9	11.4	309.4
Newton	416.2	...	42.7	7.2	34.9	331.5	1140.9	...	163.9	9.9	127.6	839.4
Pope	395.3	2.2	112.3	8.7	38.4	233.6	1254.6	5.7	471.4	15.4	143.2	619.0
Randolph	96.1	...	...	2.0	15.2	78.9	313.5	...	...	5.2	45.5	262.8
Searcy	242.5	...	20.0	2.3	29.9	190.3	641.5	...	84.9	3.4	80.2	473.1
Sharp	105.2	1.3	3.5	6.5	4.1	89.8	193.6	...	7.1	4.1	3.4	179.1
Stone	277.2	1.7	47.3	8.0	23.6	196.7	768.7	7.6	196.7	9.1	64.9	490.3
Van Buren	273.8	1.9	66.0	8.6	20.2	177.2	661.2	...	238.5	8.7	58.0	355.9
Washington	186.2	0.4	7.1	6.2	15.2	157.2	435.6	...	22.8	11.5	26.1	375.3
White	212.6	...	18.2	9.3	58.2	126.9	678.8	...	59.6	34.6	186.2	398.4
All counties	4764.8	97.9	661.7	127.6	521.4	3356.2	13651.4	324.9	2520.4	228.4	1585.3	8992.4

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 16—Volume of timber on timberland by class of timber and species group,
Ozark Counties, Arkansas, 1988

Class of timber	All species	Softwood			Hardwood	
		Pine			Soft ¹	Hard ²
		Planted	Natural	Other		
----- Million cubic feet -----						
Sawtimber trees:						
Saw-log portion	2314.1	54.7	428.6	44.1	269.9	1516.8
Upper-stem portion	414.6	8.7	61.1	7.8	48.3	288.7
Total	2728.8	63.4	489.7	51.9	318.2	1805.5
Poletimber trees	2036.0	34.4	172.0	75.7	203.3	1550.7
All growing-stock trees	4764.8	97.9	661.7	127.6	521.4	3356.2
Rough trees:						
Sawtimber size	302.3	0.3	3.8	10.9	31.6	255.8
Poletimber size	234.4	0.4	3.0	7.7	31.0	192.3
Total	536.7	0.7	6.9	18.6	62.5	448.1
Rotten trees:						
Sawtimber size	91.2	...	...	...	17.7	73.5
Poletimber size	6.9	...	...	...	1.8	5.1
Total	98.1	...	...	...	19.5	78.6
Salvable dead trees:						
Sawtimber size	13.7	1.0	...	0.5	0.3	11.9
Poletimber size	23.5	1.3	1.7	1.5	1.2	17.8
Total	37.3	2.3	1.7	2.0	1.5	29.7
All classes	5436.8	100.8	670.3	148.1	605.0	3912.5

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 17—Volume of live trees and growing stock on timberland by ownership class and species group,
Ozark Counties, Arkansas, 1988

Ownership class	Live trees						Growing stock					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
----- Million cubic feet -----												
National forest	1365.4	37.6	208.9	14.9	143.2	960.8	1264.3	37.6	208.2	14.4	126.0	878.1
Other public	214.7	13.4	12.1	7.3	47.5	134.4	195.0	13.4	12.1	5.9	40.7	123.0
Forest industry	104.0	3.3	45.5	0.8	3.9	50.5	99.0	3.3	45.4	0.8	3.6	45.9
Other private	3715.5	44.2	402.1	123.1	408.9	2737.2	3206.4	43.6	396.1	106.4	351.1	2309.2
All ownerships	5399.6	98.5	668.6	146.2	603.5	3882.8	4764.8	97.9	661.7	127.6	521.4	3356.2

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 18—Average net annual growth of growing stock and sawtimber on timberland by county and species group,
Ozark Counties, Arkansas, 1938

County	Growing stock						Sawtimber							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard ²
-----Million cubic feet-----						-----Million board feet-----								
Baxter	7.7	0.1	0.6	0.3	0.6	6.2	31.7	1.2	3.4	0.9	2.1	24.1		
Benton	8.6	...	0.1	...	0.7	7.8	30.0	...	0.5	0.2	2.1	27.3		
Boone	2.1	...	...	0.1	...	1.9	9.3	...	0.4	0.2	...	8.7		
Carroll	5.2	...	...	0.1	0.4	4.8	18.3	...	-1.0	...	0.7	18.7		
Cleburne	8.4	0.2	3.2	0.2	0.8	4.0	25.1	1.5	14.2	0.4	2.4	6.7		
Conway	5.9	...	2.0	0.4	1.0	2.5	18.6	...	7.2	1.8	3.7	5.9		
Crawford	9.6	...	1.2	0.5	1.8	6.0	35.7	...	6.0	0.7	7.1	21.9		
Faulkner	5.7	...	0.9	0.1	1.0	3.6	18.1	...	1.7	0.2	3.9	12.3		
Franklin	5.2	0.3	1.5	0.2	0.8	2.4	25.6	1.3	6.4	0.1	3.3	14.4		
Fulton	6.4	0.4	1.1	0.1	...	4.8	19.3	4.1	3.2	0.1	0.3	11.7		
Independence	6.4	...	1.1	0.2	0.5	4.5	19.4	...	2.7	0.3	1.8	14.6		
Izard	7.6	...	2.0	0.2	0.3	5.1	21.5	...	8.8	0.1	1.2	11.3		
Johnson	6.9	...	2.7	...	1.4	2.9	29.2	...	9.0	0.1	6.5	13.6		
Madison	11.9	...	0.4	0.2	1.9	9.4	54.8	...	3.7	0.5	7.5	43.1		
Marion	9.2	...	0.3	0.5	0.2	8.2	32.3	...	1.4	0.4	1.1	29.3		
Newton	18.2	...	2.3	0.4	1.6	13.9	64.5	...	9.0	0.7	6.8	48.0		
Pope	9.2	...	3.0	0.5	0.4	5.4	38.6	0.5	15.1	1.3	0.1	21.6		
Randolph	2.8	...	...	...	0.5	2.2	18.4	...	...	0.1	3.0	15.3		
Searcy	12.8	...	0.4	0.1	1.8	10.6	40.9	...	2.1	...	5.9	32.9		
Sharp	4.9	0.3	0.1	0.3	0.2	4.1	10.9	0.3	0.5	0.4	0.2	9.5		
Stone	9.9	...	1.5	0.4	1.1	7.0	40.1	...	7.1	0.8	3.0	29.1		
Van Buren	11.3	...	3.5	0.3	0.8	6.7	40.4	0.1	14.5	0.1	3.4	22.3		
Washington	6.2	...	0.4	0.3	0.6	4.9	21.3	...	0.9	0.4	1.4	18.6		
White	11.8	0.2	1.0	0.2	3.5	6.9	40.2	1.6	3.5	0.5	12.2	22.4		
All counties	194.0	1.6	29.2	5.5	22.1	135.8	704.2	10.5	120.2	10.3	79.8	483.4		

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 19—Average net annual removals of growing stock and sawtimber on timberland by county and species group, Ozark Counties, Arkansas, 1988

County	Growing stock						Sawtimber						
	All species	Softwood			Hardwood		All species	Softwood			Hardwood		
		Planted	Pine		Other	Soft ¹		Hard ²	Planted	Pine		Soft ¹	Hard ²
			Natural	Other						Natural	Other		
-----Million cubic feet-----						-----Million board feet-----							
Baxter	0.1	...	...	...	...	0.1	0.5	...	...	...	...	0.5	
Benton	1.1	...	...	...	...	1.1	4.2	...	...	...	...	4.2	
Boone	1.0	...	...	0.1	0.2	0.7	3.1	...	...	0.2	0.6	2.3	
Carroll	1.8	...	0.3	...	...	1.4	5.2	...	...	...	0.1	5.1	
Cleburne	3.8	...	1.9	...	0.1	1.8	10.9	...	7.2	...	0.2	3.5	
Conway	1.6	...	...	0.2	0.7	0.7	2.8	...	...	...	2.6	0.1	
Crawford	2.5	...	0.9	0.3	0.4	0.8	5.8	...	4.4	...	0.8	0.5	
Faulkner	1.7	...	0.5	...	0.6	0.6	7.0	...	1.8	...	2.7	2.5	
Franklin	2.5	0.4	0.6	...	0.1	1.3	7.6	0.2	3.5	...	0.4	3.4	
Fulton	3.6	...	2.0	...	0.1	1.4	11.8	...	5.6	...	0.5	5.7	
Independence	2.8	...	0.4	...	0.1	2.3	9.8	...	1.4	...	...	8.4	
Izard	1.4	...	1.2	...	0.1	0.1	5.7	...	4.8	...	0.3	0.7	
Johnson	2.8	...	1.8	...	...	1.0	7.8	...	6.6	0.2	...	1.0	
Madison	3.1	...	0.4	0.1	0.1	2.4	9.7	...	1.5	0.2	0.5	7.4	
Marion	0.2	...	...	...	...	0.2	...	...	...	...	...	...	
Newton	6.0	...	0.2	...	0.6	5.1	18.8	...	0.5	...	2.4	15.9	
Pope	5.8	...	3.1	...	0.3	2.3	16.5	...	9.9	...	0.9	5.8	
Randolph	2.9	...	...	...	0.2	2.7	9.5	...	...	...	0.3	9.2	
Searcy	2.4	...	0.1	...	0.1	2.2	7.2	...	...	...	0.2	6.9	
Sharp	3.2	1.0	...	...	...	2.2	8.4	1.1	...	...	...	7.4	
Stone	3.0	...	0.9	...	0.1	1.9	9.6	...	3.0	...	0.4	6.3	
Van Buren	2.7	0.4	1.6	...	...	0.7	7.5	1.3	5.2	...	...	1.0	
Washington	3.7	...	...	...	0.2	3.4	11.7	...	...	0.2	1.0	10.6	
White	2.8	...	...	...	0.3	2.5	8.5	...	...	...	1.4	7.2	
All counties	62.3	1.8	16.0	0.9	4.4	39.2	189.7	2.6	55.3	0.7	15.3	115.7	

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 20—Average net annual growth and average annual removals of growing stock on timberland by species, Ozark Counties, Arkansas, 1988

Species	Growth	Removals
- - - - Million cubic feet - - - -		
Yellow pines	30.7	17.8
Other softwoods	5.5	0.9
Total softwoods	36.2	18.7
Select white-red oaks	52.7	13.7
Other white-red oaks	54.1	19.1
Hickory	18.9	5.0
Hard maple	2.1	0.1
Sweetgum	6.9	1.1
Ash-walnut-black cherry	5.4	0.8
Yellow-poplar	0.1	...
Other hardwoods	17.7	3.9
Total hardwoods	157.9	43.6
All species	194.0	62.3

Table 21—Average net annual growth and average annual removals of sawtimber on timberland by species, Ozark Counties, Arkansas, 1988

Species	Growth	Removals
- - - - Million board feet - - - -		
Yellow pines	130.7	57.9
Other softwoods	10.3	0.7
Total softwoods	141.0	58.7
Select white-red oaks	195.8	42.0
Other white-red oaks	202.5	59.0
Hickory	49.5	12.6
Hard maple	7.9	...
Sweetgum	25.2	3.7
Ash-walnut-black cherry	20.6	2.2
Yellow-poplar	0.5	...
Other hardwoods	61.2	11.6
Total hardwoods	563.2	131.0
All species	704.2	189.7

Table 22—Average annual mortality of growing stock and sawtimber on timberland by species, Ozark Counties, Arkansas, 1988

Species	Growing stock	Sawtimber
- - Million cubic feet - - Million board feet - -		
Yellow pines	2.5	4.9
Other softwoods	0.4	0.6
Total softwoods	2.8	5.5
Select white-red oaks	8.9	24.4
Other white-red oaks	10.2	19.5
Hickory	3.7	6.2
Hard maple	0.2	0.3
Sweetgum	2.0	7.7
Ash-walnut-black cherry	0.8	1.8
Other hardwoods	3.6	8.0
Total hardwoods	29.5	67.8
All species	32.4	73.4

Table 23—Average net annual growth and average annual removals of growing stock on timberland by ownership class and species group, Ozark Counties, Arkansas, 1988

Ownership class	Growth						Removals					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine			Soft ¹	Hard ²		Pine			Soft ¹	Hard ²
		Planted	Natural	Other				Planted	Natural	Other		
-----Million cubic feet-----												
National forest	38.6	0.4	7.7	0.8	4.5	25.2	12.8	0.4	2.7	...	0.8	8.8
Other public	8.9	0.3	0.3	0.1	1.7	6.4	1.9	1.0	...	...	...	0.8
Forest industry	6.4	...	3.0	0.1	0.2	3.1	5.0	...	2.4	...	...	2.7
Other private	140.2	0.8	18.1	4.4	15.7	101.2	42.6	0.4	10.9	0.9	3.6	26.9
All ownerships	194.0	1.6	29.2	5.5	22.1	135.8	62.3	1.8	16.0	0.9	4.4	39.2

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 24—Average net annual growth and average annual removals of sawtimber on timberland by ownership class and species, Ozark Counties, Arkansas, 1988

Ownership class	Growth						Removals					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine			Soft ¹	Hard ²		Pine			Soft ¹	Hard ²
		Planted	Natural	Other				Planted	Natural	Other		
-----Million board feet-----												
National forest	174.5	2.0	36.7	0.9	20.8	114.0	40.9	0.2	12.2	...	2.2	26.3
Other public	41.0	1.5	1.9	0.3	6.7	30.6	4.6	1.1	0.2	...	...	3.4
Forest industry	16.8	...	9.5	...	0.4	6.9	13.3	...	7.9	...	...	5.4
Other private	471.9	7.0	72.1	9.1	51.9	331.8	130.9	1.3	35.0	0.7	13.1	80.7
All ownerships	704.2	10.5	120.2	10.3	79.8	483.4	189.7	2.6	55.3	0.7	15.3	115.7

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

**Table 25—Volume of sawtimber on timberland by species and tree grade,
Ozark Counties, Arkansas, 1988**

Species	All grades	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
----- Million board feet -----						
Yellow pines	2845.3	540.4	427.0	1859.3	...	18.7
Cypress	32.6	...	16.3	12.7	...	3.6
Redcedar	195.7	182.5	...	...	...	13.3
Total softwoods	3073.7	722.8	443.3	1871.9	...	35.6
Select white-red oaks	3628.7	96.7	508.3	1930.9	847.1	245.7
Other white-red oaks	3765.5	94.4	499.1	1931.5	937.7	302.8
Hickory	1080.6	44.2	114.9	540.3	285.0	96.2
Hard maple	99.7	...	...	34.7	41.2	23.9
Sweetgum	602.7	43.2	111.1	270.2	132.1	46.1
Tupelo and blackgum	507.9	37.3	123.0	212.2	34.9	100.5
Ash-walnut-black cherry	314.0	40.0	81.5	120.6	11.5	60.4
Yellow-poplar	4.0	...	...	...	4.0	...
Other hardwoods	574.5	40.1	75.5	251.1	105.4	102.3
Total hardwoods	10577.7	395.9	1513.4	5291.5	2399.0	978.0
All species	13651.4	1118.7	1956.7	7163.4	2399.0	1013.6

Supplemental Tables 26-36

**Table 26—Area of timberland by stand age, forest type group and type of regeneration,
Ozark Counties, Arkansas, 1988**

Stand age class	Pine		Oak-pine		Other hardwood types	
	Artificial	Natural	Artificial	Natural	Artificial	Natural
----- Thousand acres -----						
1-10	32.5	5.6	5.0	5.6	5.7	64.7
11-20	10.3	...	...	12.3	...	...
21-30	...	10.8	6.6	...	...	6.6
31-40	6.3	7.1	...	...	...	...
41-50	5.6	...	...	...	...	...
>50	5.1	...	...	...	...	...
Mixed	27.1	392.5	22.9	718.8	29.7	4348.7
Total	86.9	416.0	34.5	736.7	35.4	4420.1

Table 27—*Volume of softwood growing stock on timberland by forest type, Ozark Counties, Arkansas, 1988*

County	Total	Forest type group				
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress
		Planted	Natural			
----- Million cubic feet -----						
Baxter	27.5	12.1	0.4	10.9	4.0	...
Benton	3.1	...	1.2	...	1.9	...
Boone	2.2	...	...	1.0	1.2	...
Carroll	10.9	...	...	6.7	4.2	...
Cleburne	78.8	11.3	32.7	25.0	9.7	...
Conway	40.2	...	17.5	16.5	6.2	...
Crawford	42.2	2.3	18.8	16.8	4.3	...
Faulkner	12.3	5.6	...	4.6	2.1	...
Franklin	43.5	...	29.6	11.9	2.0	...
Fulton	22.0	21.0	...	0.2	0.9	...
Independence	32.8	...	17.5	10.2	5.1	...
Izard	59.5	...	39.2	12.3	8.0	...
Johnson	101.4	27.9	49.2	19.8	4.6	...
Madison	12.5	...	0.2	12.1	0.2	...
Marion	14.9	...	7.2	1.9	5.9	...
Newton	49.8	...	23.7	15.6	10.6	...
Pope	123.3	...	75.6	35.6	11.7	0.3
Randolph	2.0	...	0.6	...	1.0	0.4
Searcy	22.3	...	9.4	2.2	10.7	...
Sharp	11.3	...	1.7	6.0	3.6	...
Stone	57.0	2.8	15.5	31.5	7.1	...
Van Buren	76.4	1.9	32.5	29.0	13.0	...
Washington	13.7	...	4.1	7.6	2.0	...
White	27.5	...	10.4	5.3	5.6	6.3
All counties	887.2	84.8	387.0	282.6	125.7	7.0

**Table 28—Volume of hardwood growing stock on timberland by forest type,
Ozark Counties, Arkansas, 1988**

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress	Elm-ash- cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Baxter	144.2	2.6	...	13.5	128.2	...	...
Benton	179.1	...	...	0.4	175.1	...	3.5
Boone	91.3	...	...	6.1	85.2	...	...
Carroll	111.4	...	...	3.1	108.4	...	...
Cleburne	100.9	2.1	8.1	26.7	61.7	2.3	...
Conway	76.5	...	4.7	14.6	37.6	19.6	...
Crawford	188.7	1.3	...	29.4	154.8	3.2	...
Faulkner	84.2	0.3	...	4.2	50.8	28.9	...
Franklin	163.5	...	4.1	13.9	143.4	2.1	...
Fulton	75.5	0.8	...	1.0	73.8	...	...
Independence	117.4	...	3.1	14.5	94.4	5.3	...
Izard	96.0	...	7.3	14.4	69.0	5.3	...
Johnson	225.4	3.8	6.5	20.7	194.5	...	...
Madison	298.1	...	...	9.0	289.1	...	...
Marion	103.5	...	2.0	2.6	98.9	...	...
Newton	366.4	...	5.4	15.0	346.0	...	...
Pope	272.0	...	13.3	28.5	228.5	1.8	...
Randolph	94.1	...	0.4	1.9	62.1	29.6	...
Searcy	220.2	...	2.9	6.3	200.7	10.3	...
Sharp	94.0	...	1.1	6.2	80.2	6.4	...
Stone	220.3	0.9	3.1	31.9	184.4	...	...
Van Buren	197.4	...	3.4	25.4	168.5	...	...
Washington	172.4	...	...	6.0	166.4	...	...
White	185.1	...	5.9	4.4	75.5	99.3	...
All counties	3877.6	11.7	71.4	299.7	3277.0	214.2	3.5

Table 29—Volume of softwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, Ozark Counties, Arkansas, 1988

County	Total	Forest type group				
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress
		Planted	Natural			
----- Million cubic feet -----						
Baxter	15.9	7.2	...	7.2	1.5	...
Benton	2.5	...	0.8	...	1.6	...
Boone	1.1	...	...	...	1.1	...
Carroll	5.9	...	...	4.1	1.8	...
Cleburne	50.5	8.6	21.0	14.6	6.3	...
Conway	22.4	...	7.9	11.3	3.2	...
Crawford	27.6	...	17.7	7.9	2.0	...
Faulkner	4.0	0.9	...	2.0	1.1	...
Franklin	24.2	...	17.5	6.5	0.3	...
Fulton	9.4	9.1	...	...	0.3	...
Independence	16.3	...	10.6	3.4	2.3	...
Isard	29.8	...	18.5	5.7	5.7	...
Johnson	69.5	23.5	29.9	13.4	2.7	...
Madison	9.1	...	...	8.9	0.2	...
Marion	6.6	...	5.3	0.2	1.1	...
Newton	29.9	...	15.4	7.4	7.2	...
Pope	80.5	...	54.4	20.6	5.5	...
Randolph	1.4	...	0.3	...	0.6	0.4
Searcy	15.8	...	8.1	0.3	7.4	...
Sharp	2.1	...	...	1.1	1.0	...
Stone	35.6	1.7	7.2	23.0	3.7	...
Van Buren	44.2	...	18.7	19.0	6.6	...
Washington	6.3	...	1.9	3.9	0.4	...
White	16.8	...	4.7	4.0	2.4	5.6
All counties	527.4	51.0	239.7	164.6	66.0	6.1

Table 30—Volume of hardwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, Ozark Counties, Arkansas, 1988

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress	Elm-ash- cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Baxter	78.0	1.8	...	5.9	70.3	...	...
Benton	93.6	...	...	0.4	92.8	...	0.4
Boone	46.8	...	...	3.3	43.5	...	...
Carroll	57.3	...	...	0.6	56.7	...	...
Cleburne	30.3	0.9	2.5	8.7	17.5	0.7	...
Conway	35.8	...	3.3	6.3	15.8	10.4	...
Crawford	92.2	...	...	12.4	79.5	0.4	...
Faulkner	37.5	0.1	...	0.7	18.8	17.9	...
Franklin	75.9	...	1.4	3.6	70.2	0.7	...
Fulton	28.2	0.2	...	0.7	27.3	...	...
Independence	62.6	...	0.6	7.3	50.0	4.7	...
Izard	40.7	...	1.6	5.7	29.8	3.5	...
Johnson	113.3	0.9	2.4	6.4	103.5	...	...
Madison	142.8	...	...	3.7	139.1	...	...
Marion	49.5	...	0.6	1.1	47.8	...	...
Newton	160.5	...	4.0	5.7	150.7	...	...
Pope	127.9	...	4.0	10.8	112.0	1.0	...
Randolph	51.6	...	...	1.2	29.3	21.1	...
Searcy	93.9	...	0.9	0.5	87.2	5.2	...
Sharp	32.7	...	0.6	1.4	26.1	4.7	...
Stone	95.0	0.2	0.5	19.0	75.3	...	...
Van Buren	70.9	...	0.3	9.8	60.8	...	...
Washington	69.7	...	...	3.3	66.3	...	...
White	100.3	...	1.2	1.2	29.9	67.9	...
All counties	1786.7	4.2	24.0	119.7	1500.1	138.3	0.4

Table 31—*Volume of timber on timberland by county, class of timber and species group, Ozark Counties, Arkansas, 1988*

County	All classes	Growing stock		Rough		Rotten	
		Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
-----Million cubic feet-----							
Baxter	197.6	27.5	144.2	1.4	22.2	...	2.3
Benton	206.2	3.1	179.1	...	23.7	...	0.4
Boone	110.2	2.2	91.3	0.2	13.7	...	2.8
Carroll	152.8	10.9	111.4	0.8	25.0	...	4.7
Cleburne	189.3	78.8	100.9	0.9	7.4	...	1.4
Conway	129.9	40.2	76.5	2.9	9.2	...	1.1
Crawford	254.9	42.2	188.7	2.2	20.6	...	1.2
Faulkner	114.4	12.3	84.2	0.7	15.0	...	2.2
Franklin	237.7	43.5	163.5	0.8	23.5	...	6.4
Fulton	115.8	22.0	75.5	1.0	16.7	...	0.5
Independence	168.4	32.8	117.4	0.9	15.3	...	2.0
Izard	176.1	59.5	96.0	0.9	17.0	...	2.7
Johnson	355.4	101.4	225.4	1.6	23.0	...	4.0
Madison	353.3	12.5	298.1	0.9	31.3	...	10.5
Marion	141.2	14.9	103.5	0.8	17.9	...	4.1
Newton	482.4	49.8	366.4	0.6	48.8	...	16.8
Pope	420.4	123.3	272.0	1.0	20.2	...	4.0
Randolph	118.1	2.0	94.1	0.8	17.5	...	3.7
Searcy	276.9	22.3	220.2	0.6	23.5	...	10.2
Sharp	132.6	11.3	94.0	0.7	24.0	...	2.6
Stone	304.2	57.0	220.3	1.7	22.0	...	3.2
Van Buren	303.1	76.4	197.4	2.1	19.2	...	8.1
Washington	229.9	13.7	172.4	1.0	40.9	...	1.9
White	228.5	27.5	185.1	1.6	13.2	...	1.1
All counties	5399.6	887.2	3877.6	26.1	510.6	...	98.1

Table 32—Number of live trees on timberland by detailed species and diameter class, Ozark Counties, Arkansas, 1988

Species	Diameter class (inches at breast height)												
	All classes	1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----													
Shortleaf pine	243531	101159	59819	28499	24048	13266	9094	4636	1810	831	274	95	...
Loblolly pine	13412	5590	3061	1926	1658	815	297	57	...	...	...	8	...
Redcedar	255568	159191	59890	19577	11156	3303	1587	598	196	55	...	15	...
Cypress	1512	601	601	134	...	...	...	47	36	13	44	33	4
Total softwoods	514024	266541	123371	50135	36863	17384	10978	5338	2041	899	317	151	4
Select white oaks	324041	124165	74915	49039	32801	19355	10323	6819	3082	1717	906	870	48
Select red oaks	104386	41450	15939	13743	10709	7815	5583	3913	2302	1344	788	749	51
Other white oaks	274144	111260	74703	35623	22151	12953	7227	4344	2806	1321	746	993	17
Other red oaks	281990	142954	48578	27712	22298	13885	10226	6495	4359	2394	1418	1538	132
Sweet pecan	88	...	...	...	66	...	...	22	...	...	...	...	...
Water hickory	1272	653	...	141	308	...	70	...	37	28	22	9	4
Other hickories	560383	326091	113710	63648	29189	15012	6705	3613	1483	466	247	203	17
Persimmon	67606	55113	10443	1393	377	136	119	24	...	...	...	...	...
Hard maple	61497	39253	13906	2482	3117	1406	564	367	192	109	57	45	...
Soft maple	116754	90184	18602	4878	1371	852	405	221	71	52	86	33	...
Boxelder	3162	1564	534	272	237	252	151	39	73	30	...	10	...
Beech	10776	7646	1500	535	186	109	191	111	141	120	94	145	...
Sweetgum	65131	27656	15434	10260	4696	2395	2003	1216	672	406	194	189	10
Blackgum	145820	103255	22697	7767	4948	2141	1515	1114	1173	520	255	404	32
Other gums/tupelos	1234	...	...	254	377	170	123	100	36	58	22	65	28
White ash	50331	32206	10031	3346	1900	1166	830	380	258	90	44	60	21
Other ashes	11587	8152	1030	1040	389	207	153	182	114	102	103	104	11
Sycamore	5589	1489	1363	801	694	407	235	215	150	119	34	73	10
Cottonwood	42	...	...	...	...	...	...	...	18	...	12	12	...
Basswood	3840	2590	511	104	163	91	203	85	42	12	21	17	...
Yellow-poplar	46	...	...	...	...	...	27	19	...	...	...	...	...
Magnolia	464	...	...	175	66	122	55	...	15	23	9	...	...
Willow	1597	522	...	367	282	279	40	44	39	17	...	8	...
Black walnut	8633	2125	2573	1309	1186	720	334	119	129	85	19	35	...
Black cherry	25368	17779	3928	1669	862	646	140	229	36	27	30	22	...
American elm	25942	17564	3622	2302	1447	401	232	153	90	66	12	53	...
Other elms	240521	178399	44565	11000	4030	1544	468	211	159	36	61	47	...
River birch	372	...	...	180	...	40	28	...	32	40	33	9	10
Hackberry	12857	8833	1117	1208	799	407	192	178	36	58	13	17	...
Black locust	10271	3606	1946	2402	1018	709	367	82	94	36	11	...	...
Other locusts	5214	2601	1176	426	219	532	113	90	36	...	21	...	...
Sassafras	85036	75269	7307	2112	133	191	25	...	...	...	...	...	...
Dogwood	313696	263764	45231	3990	570	140	...	...	...	...	...	...	...
Holly	609	462	...	147	...	...	...	...	...	...	...	...	...
Other commercial	15180	8845	4200	1514	288	171	60	46	17	26	11	...	...
Total hardwoods	2835478	1695450	539560	251839	146879	84254	48706	30430	17692	9300	5267	5711	391
Noncommercial	287884	226856	38272	11744	5687	2549	1195	825	477	152	88	40	...
All species	3637386	2188847	701204	313718	189428	104187	60879	36593	20210	10351	5672	5902	394

Table 33—Number of growing-stock trees on timberland by detailed species and diameter class, Ozark Counties, Arkansas, 1988

Species	All classes	Diameter class (inches at breast height)									
		5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----											
Shortleaf pine	80522	27173	23767	12989	9037	4590	1793	819	274	80	...
Loblolly pine	4648	1845	1658	815	265	57	...	...	...	8	...
Redcedar	31174	17208	9675	2340	1273	463	163	44	...	7	...
Cypress	276	134	...	...	...	27	36	13	32	33	1
Total softwoods	116621	46360	35101	16144	10575	5138	1992	876	306	128	1
Select white oaks	111748	43901	30145	18199	8763	5688	2536	1265	671	550	29
Select red oaks	40247	12026	9355	6932	4608	3338	1829	1044	614	476	26
Other white oaks	72649	30345	19282	11129	5053	3076	1912	755	538	547	12
Other red oaks	81365	24587	21267	12936	8707	5705	3774	2047	1161	1105	76
Sweet pecan	88	...	66	...	...	22	...	...	...	...	...
Water hickory	522	141	211	...	70	...	37	28	22	9	4
Other hickories	99519	51262	25396	12900	5127	2865	1215	386	208	142	17
Persimmon	1575	1130	230	94	98	24	...	...	...	...	...
Hard maple	6674	2030	2469	1266	389	283	126	60	24	28	...
Soft maple	5250	3441	747	547	220	138	56	26	55	19	...
Boxelder	474	95	172	122	32	39	...	14	...	...	...
Beech	1136	535	186	109	26	37	56	72	48	69	...
Sweetgum	19790	8958	4283	2306	1770	1095	659	392	174	142	10
Blackgum	14986	5750	3955	1833	1153	679	827	352	156	258	22
Other gums/tupelos	1021	254	377	170	...	49	...	58	22	65	26
White ash	5540	2313	1285	750	565	316	131	90	25	44	21
Other ashes	1703	580	296	178	92	182	66	91	103	104	11
Sycamore	1948	405	479	334	209	174	135	96	34	73	10
Cottonwood	42	...	...	...	...	...	18	...	12	12	...
Basswood	586	...	163	91	181	85	28	12	9	17	...
Yellow-poplar	46	...	...	...	27	19	...	...	...	...	...
Magnolia	203	...	66	36	55	...	15	23	9	...	...
Willow	950	367	204	232	40	44	39	17	...	8	...
Black walnut	2684	838	959	457	197	60	97	61	9	5	...
Black cherry	2743	1044	801	559	59	188	36	13	30	14	...
American elm	3357	1596	1028	326	168	109	53	38	12	26	...
Other elms	12417	7095	3310	1361	335	115	107	36	39	18	...
River birch	167	70	...	...	...	...	32	13	33	9	10
Hackberry	2152	962	538	282	162	103	18	58	13	17	...
Black locust	1442	716	383	211	56	39	12	25	...	...	...
Other locusts	746	...	154	416	57	72	36	...	11	...	...
Sassafras	903	775	59	45	25	...	...	...	...	...	...
Dogwood	601	554	...	47	...	...	...	...	...	...	...
Holly	147	147	...	...	...	...	...	...	...	...	...
Other commercial	533	222	145	132	...	22	...	13	...	...	...
Total hardwoods	495954	202138	128008	73998	38243	24567	13850	7084	4032	3759	275
All species	612574	248498	163109	90142	48818	29704	15842	7960	4338	3888	276

Table 34—Volume of growing-stock trees on timberland by species and diameter class,
Ozark Counties, Arkansas, 1988

Species	Diameter class (inches at breast height)										
	All classes	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Million cubic feet-----											
Shortleaf pine	728.8	60.2	132.8	140.0	154.0	115.4	65.7	40.3	15.0	5.5	...
Longleaf pine	30.8	3.2	10.2	10.7	4.7	1.3	...	...	...	0.7	...
Redcedar	120.9	35.8	39.6	18.2	15.2	7.4	3.2	1.1	...	0.3	...
Cypress	6.7	0.3	...	...	...	0.8	0.9	0.2	1.8	1.4	1.3
Total softwoods	887.2	99.6	182.6	168.9	173.9	124.8	69.8	41.6	16.8	7.9	1.3
Select white oaks	902.8	114.8	173.7	181.8	134.5	119.7	71.6	45.5	29.4	29.3	2.6
Select red oaks	449.6	31.9	53.6	68.9	71.4	70.6	52.3	39.2	28.2	31.3	2.2
Other white oaks	453.7	61.8	84.4	86.0	61.4	49.9	41.3	21.2	18.5	27.7	1.4
Other red oaks	812.1	52.9	107.2	117.1	122.9	111.4	103.8	73.1	49.3	66.4	8.0
Sweet pecan	0.7	...	0.3	...	...	0.4	...	...	...	...	...
Water hickory	8.5	0.3	1.2	...	1.1	...	0.9	1.7	1.5	0.8	0.9
Other hickories	524.7	95.9	109.2	110.8	73.2	61.8	34.4	16.4	10.8	9.9	2.4
Persimmon	6.2	2.1	1.5	0.9	1.3	0.4	...	...	...	...	...
Hard maple	49.2	4.6	12.5	12.3	5.2	5.9	4.1	1.9	1.1	1.6	...
Soft maple	29.7	8.7	3.8	4.7	3.1	3.1	1.7	1.5	2.2	0.9	...
Boxelder	4.2	0.4	0.8	1.0	0.5	0.8	...	0.7	...	...	...
Beech	16.9	1.2	0.8	1.5	0.3	1.1	1.8	3.7	2.1	4.5	...
Sweetgum	185.0	18.2	23.1	22.9	30.5	27.5	22.9	17.0	10.1	11.0	1.8
Blackgum	140.4	12.3	19.9	16.9	16.4	15.5	22.2	14.1	6.7	14.6	2.0
Other gums/tupelos	12.8	0.6	1.4	1.2	...	0.8	...	1.4	0.7	4.0	2.7
White ash	43.4	4.8	6.3	6.8	7.1	6.0	3.6	3.4	0.9	2.0	2.8
Other ashes	27.0	1.3	1.9	1.4	1.0	3.4	1.8	3.4	3.9	7.4	1.4
Sycamore	32.0	1.2	2.7	4.2	3.4	4.9	4.4	3.2	1.6	5.1	1.4
Cottonwood	2.6	...	...	...	...	...	0.8	...	0.6	1.1	...
Basswood	11.5	...	0.7	1.0	2.9	2.0	1.1	0.7	0.6	2.5	...
Yellow-poplar	1.0	...	...	...	0.5	0.5	...	...	...	...	...
Magnolia	3.9	...	0.5	0.3	0.9	...	0.6	1.2	0.5	...	...
Willow	6.7	0.9	0.6	2.0	0.4	0.6	1.2	0.5	...	0.5	...
Black walnut	19.8	1.6	4.3	4.5	2.9	1.3	2.7	2.0	0.4	0.2	...
Black cherry	19.8	2.6	3.7	4.6	1.1	4.3	1.1	0.4	1.1	0.9	...
American elm	19.5	3.0	5.1	2.7	2.3	2.1	1.6	1.3	0.4	1.1	...
Other elms	54.6	14.0	13.9	11.8	5.6	1.9	3.1	1.3	1.7	1.2	...
River birch	3.6	0.2	...	...	...	...	0.7	0.4	1.0	0.4	0.9
Hackberry	14.3	1.5	2.3	2.7	2.4	1.8	0.5	1.8	0.4	1.0	...
Black locust	7.2	1.1	1.8	1.8	0.7	0.7	0.3	0.7	...	...	...
Other locusts	7.9	...	0.9	3.1	1.1	1.5	0.9	...	0.5	...	...
Sassafras	2.6	1.6	0.4	0.4	0.2	...	...	...	...	...	...
Dogwood	1.1	0.8	...	0.3	...	...	...	...	...	...	...
Holly	0.2	0.2	...	...	...	...	...	...	...	...	...
Other commercial	2.4	0.4	0.6	0.7	...	0.3	...	0.4	...	...	...
Total hardwoods	3877.6	441.1	638.9	674.0	554.6	500.2	381.2	258.1	173.9	225.2	30.6
All species	4764.8	540.6	821.4	842.9	728.5	625.0	451.0	299.7	190.7	233.1	31.9

Table 35—Volume of growing stock in the saw-log portion of sawtimber trees on timberland by detailed species and diameter class, Ozark Counties, Arkansas, 1988

Species	All classes	Diameter class (inches at breast height)							
		9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million cubic feet -----									
Shortleaf pine	469.1	115.9	136.0	101.9	59.8	37.0	13.3	5.2	...
Loblolly pine	14.3	8.4	4.2	1.0	...	...	...	0.6	...
Redcedar	38.0	14.7	13.1	6.5	2.5	1.0	...	0.2	...
Cypress	6.1	...	...	0.7	0.8	0.2	1.7	1.4	1.3
Total softwoods	527.4	138.9	153.3	110.1	63.0	38.2	15.0	7.5	1.3
Select white oaks	358.8	...	103.4	100.8	61.3	40.1	26.2	24.6	2.4
Select red oaks	249.5	...	55.7	59.9	45.2	34.5	24.8	27.3	2.2
Other white oaks	188.8	...	49.9	42.7	35.8	18.2	16.2	24.6	1.4
Other red oaks	451.8	...	95.8	94.2	90.4	63.8	42.9	57.3	7.4
Sweet pecan	0.3	...	...	0.3	...	...	...	...	...
Water hickory	6.0	...	0.7	...	0.9	1.5	1.4	0.7	0.9
Other hickories	174.0	...	57.5	52.5	29.0	14.7	9.3	8.7	2.3
Persimmon	1.3	...	1.0	0.3	...	...	...	...	...
Hard maple	16.0	...	4.1	4.5	3.6	1.6	0.9	1.2	...
Soft maple	10.2	...	2.3	2.5	1.3	1.3	1.9	0.8	...
Boxelder	1.6	...	0.3	0.7	...	0.5	...	...	...
Beech	11.7	...	0.2	0.9	1.7	3.1	1.7	4.0	...
Sweetgum	100.9	...	21.7	22.6	19.9	15.7	9.2	10.2	1.8
Blackgum	79.9	...	11.9	13.1	20.2	12.9	6.3	13.6	1.9
Other gums/tupelos	8.4	...	...	0.5	...	1.0	0.6	3.8	2.6
White ash	21.3	...	5.5	5.0	3.0	3.1	0.8	1.8	2.2
Other ashes	19.4	...	0.7	2.8	1.6	2.9	3.4	6.7	1.4
Sycamore	20.2	...	2.2	3.8	4.0	2.9	1.5	4.6	1.3
Cottonwood	2.2	...	...	...	0.6	...	0.6	1.1	...
Basswood	8.6	...	2.4	1.7	1.1	0.6	0.5	2.3	...
Yellow-poplar	0.7	...	0.4	0.3	...	...	...	...	...
Magnolia	2.6	...	0.6	...	0.5	1.1	0.4	...	...
Willow	2.7	...	0.2	0.4	1.1	0.5	...	0.5	...
Black walnut	7.5	...	2.1	1.1	2.0	1.8	0.3	0.2	...
Black cherry	7.2	...	0.7	3.9	0.8	0.4	0.6	0.8	...
American elm	7.3	...	1.8	1.7	1.3	1.2	0.4	0.8	...
Other elms	12.6	...	4.5	1.6	2.7	1.2	1.5	1.1	...
River birch	3.2	...	...	...	0.7	0.4	0.9	0.4	0.9
Hackberry	6.1	...	1.6	1.3	0.4	1.5	0.3	1.0	...
Black locust	2.0	...	0.5	0.6	0.2	0.7	...	...	...
Other locusts	3.0	...	0.8	1.1	0.7	...	0.4	...	...
Sassafras	0.1	...	0.1	...	...	...	...	...	...
Other commercial	0.7	...	...	0.3	...	0.4	...	...	...
Total hardwoods	1786.7	...	428.6	421.2	329.8	227.4	153.0	198.0	28.8
All species	2314.1	138.9	581.9	531.3	392.8	265.7	168.0	205.5	30.1

**Table 36—Volume of timber on timberland by species and class of timber,
Ozark Counties, Arkansas, 1988**

Species	All live	Growing stock	Rough	Rotten
----- Million cubic feet -----				
Shortleaf pine	735.9	728.8	7.1	...
Loblolly pine	31.2	30.8	0.5	...
Redcedar	138.7	120.9	17.8	...
Cypress	7.5	6.7	0.8	...
Total softwoods	913.3	887.2	26.1	...
Select white oaks	990.0	902.8	77.2	10.0
Select red oaks	506.0	449.6	39.8	16.6
Other white oaks	542.4	453.7	72.9	15.8
Other red oaks	882.3	812.1	52.5	17.7
Sweet pecan	0.7	0.7	...	...
Water hickory	8.7	8.5	0.2	...
Other hickories	592.4	524.7	59.5	8.2
Persimmon	7.5	6.2	1.3	...
Hard maple	59.2	49.2	8.8	1.2
Soft maple	40.7	29.7	9.5	1.5
Boxelder	7.0	4.2	1.9	0.9
Beech	26.2	16.9	5.4	3.8
Sweetgum	193.8	185.0	5.5	3.3
Blackgum	172.4	140.4	19.1	12.9
Other gums/tupelos	15.8	12.8	2.9	0.1
White ash	55.6	43.4	11.4	0.8
Other ashes	29.6	27.0	2.5	0.1
Sycamore	35.4	32.0	3.2	0.3
Cottonwood	2.6	2.6	...	...
Basswood	12.5	11.5	0.6	0.4
Yellow-poplar	1.0	1.0	...	...
Magnolia	4.5	3.9	0.4	0.2
Willow	6.9	6.7	0.2	...
Black walnut	25.0	19.8	4.7	0.6
Black cherry	23.7	19.8	4.0	...
American elm	25.3	19.5	5.4	0.3
Other elms	68.6	54.6	13.5	0.6
River birch	4.8	3.6	1.2	...
Hackberry	17.3	14.3	2.9	0.1
Black locust	18.0	7.2	8.2	2.6
Other locusts	9.8	7.9	1.9	...
Sassafras	4.1	2.6	1.1	0.4
Dogwood	5.9	1.1	4.9	...
Holly	0.2	0.2	...	...
Other commercial	5.8	2.4	3.4	...
Total hardwoods	4401.7	3877.6	426.0	98.1
Noncommercial	84.6	...	84.6	...
All species	5399.6	4764.8	536.7	98.1

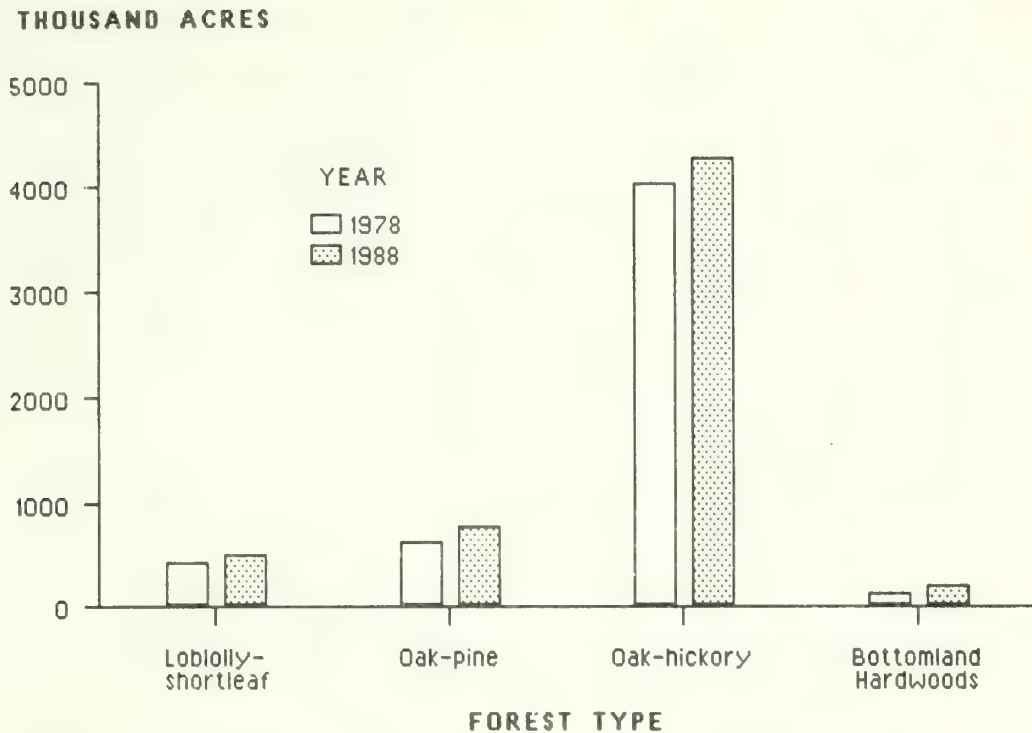


Figure 1.--Area of timberland by forest type, Ozark Counties, Arkansas, 1978 and 1988.

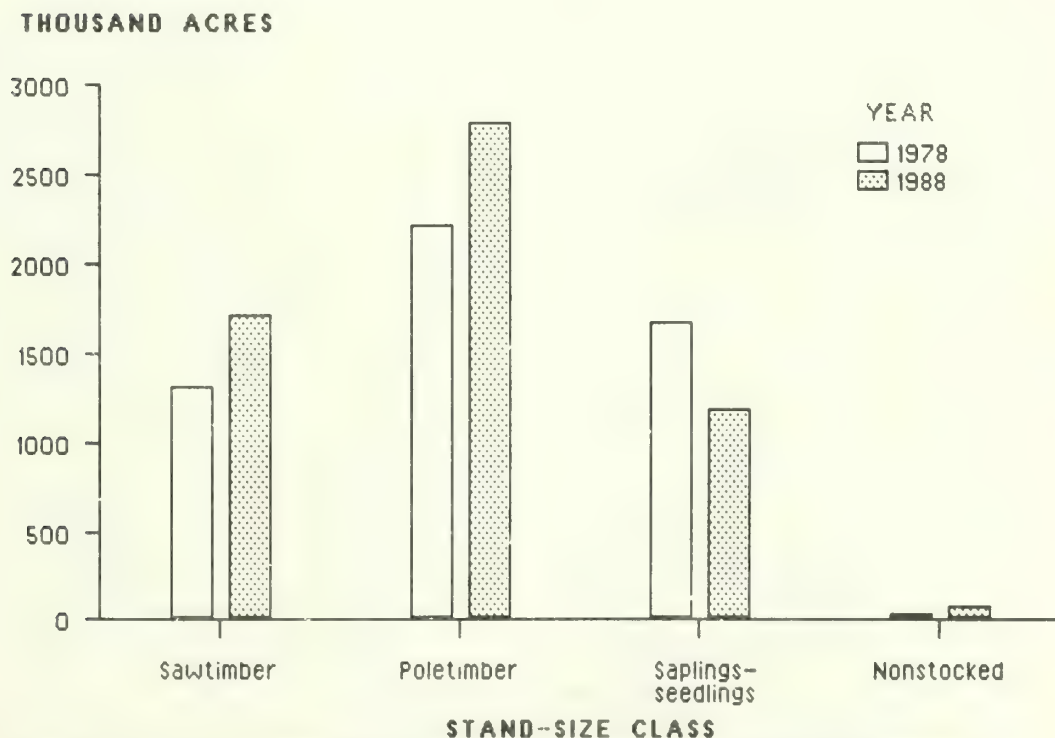


Figure 2.--Area of timberland by stand-size class, Ozark Counties, Arkansas, 1978 and 1988.

MILLION CUBIC FEET

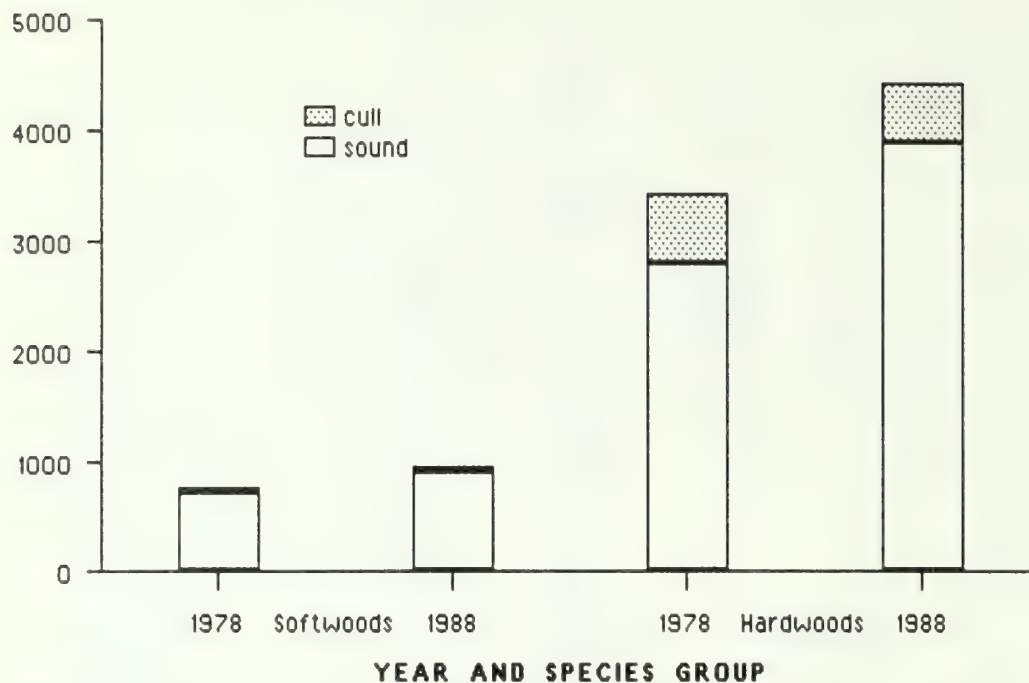


Figure 3.--Volume of timber on timberland by species group and class of timber, Ozark Counties, Arkansas, 1978 and 1988.

MILLION CUBIC FEET

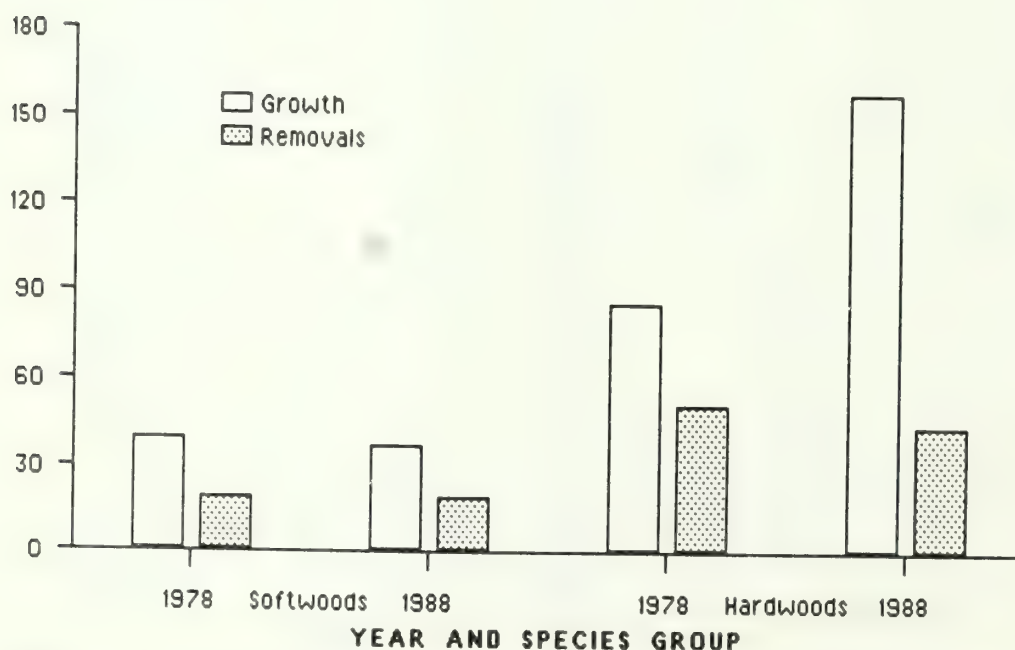


Figure 4.--Average net annual growth and average annual removals of growing stock on timberland by species group, Ozark Counties, Arkansas, 1978 and 1988.

MILLION CUBIC FEET

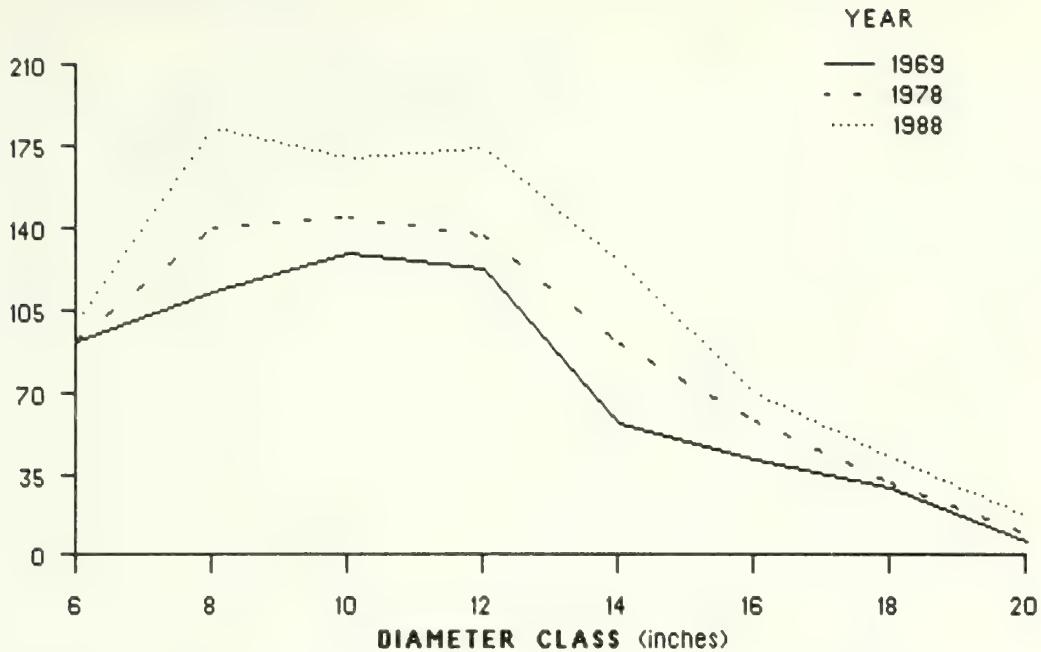


Figure 5.--Volume of softwood growing stock on timberland by diameter class, Ozark Counties, Arkansas, 1969, 1978, and 1988.

MILLION CUBIC FEET

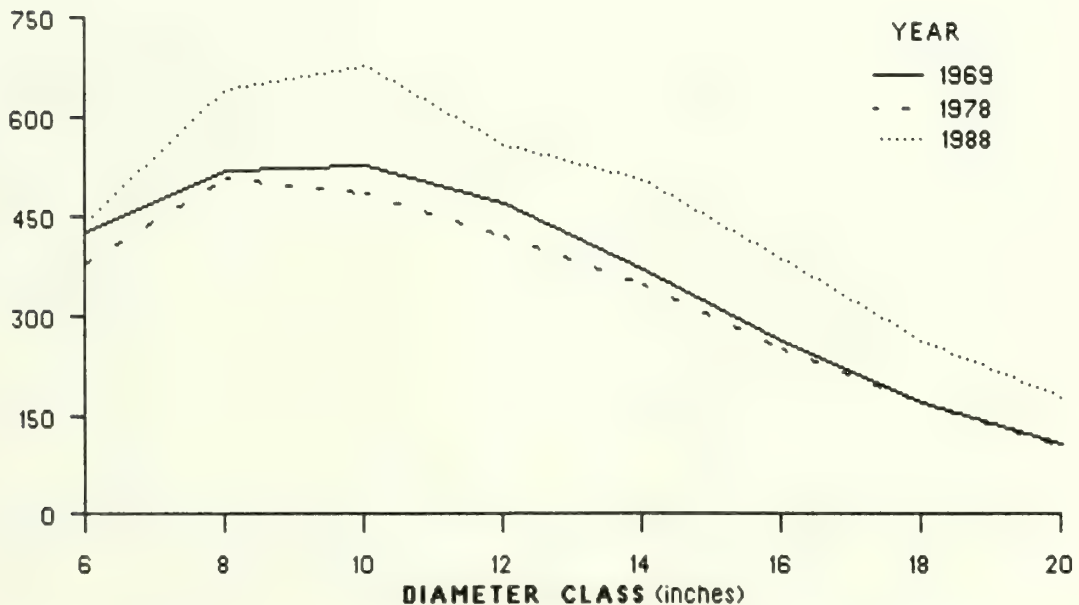


Figure 6.--Volume of hardwood growing stock on timberland by diameter class, Ozark Counties, Arkansas, 1969, 1978, and 1988.

MILLION TREES

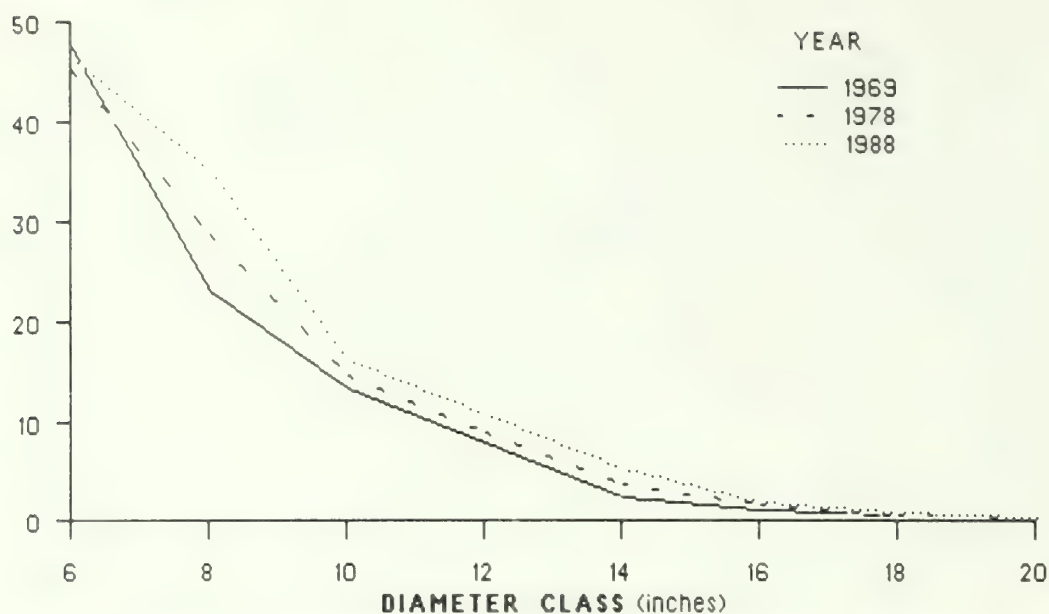


Figure 7.--Number of softwood growing-stock trees on timberland by diameter class, Ozark Counties, Arkansas, 1969, 1978, and 1988.

MILLION TREES

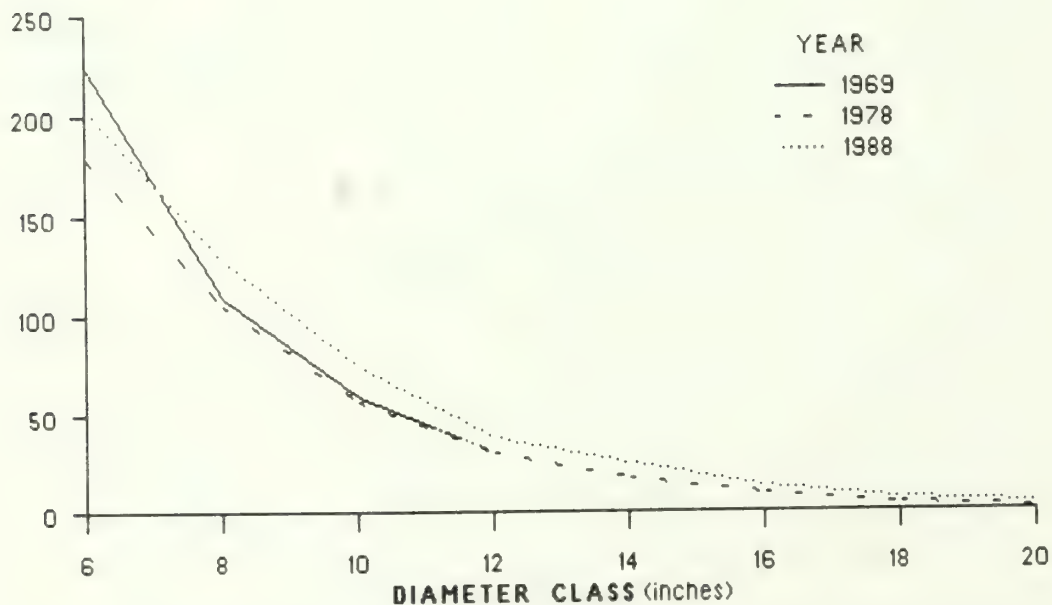


Figure 8.--Number of hardwood growing-stock trees on timberland by diameter class, Ozark Counties, Arkansas, 1969, 1978, and 1988.

PERCENT CHANGE

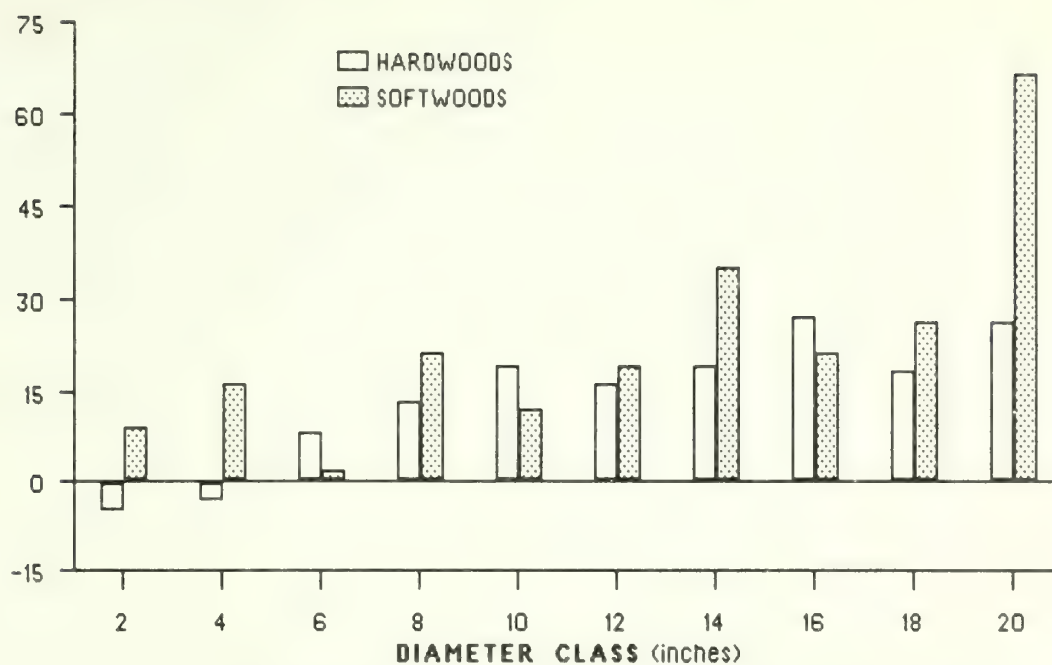


Figure 9.--Percent change in the number of live trees on timberland by species group and diameter class, Ozark Counties, Arkansas, 1978 and 1988.

Hines, F. Dee, Forest Statistics for Arkansas' Ozark Counties—1988. Resource Bull. SO-131. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 1988. 39 p.

Tabulates forest resource information from a new inventory of Arkansas' Ozark Unit.

Additional Keywords: Area, volume, forest type, stand size, ownership.



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Nontimber Values of Louisiana's Timberland

Victor A. Rudis



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Figure 1.—Forest survey units of Louisiana.

Nontimber Values of Louisiana's Timberland

Victor A. Rudis

HIGHLIGHTS

- As a companion publication to the Louisiana timber report (Rosson and others 1988), this document presents information about the other forest values associated with Louisiana's timberland. These "nontimber" values include water quality, soils, livestock potential, wildlife habitat, aesthetics, and dispersed recreation opportunities in timberland areas.
- Approximately 3 percent of the timberland acreage exists along steep slopes (greater than 15 percent slope).
- Forest attributes important to wildlife, such as snags and nut-bearing tree species, are abundant at the State level but are distributed unevenly. Large diameter trees are concentrated in hardwood bottoms.
- Timberland with high recreation values is distributed unevenly. Hunting and camping facilities are abundant but there are regional shortages. The diversity of forest types near metropolitan areas is limited.
- Remote stands (i.e., stands distant from roads and part of large forested tracts) and stands with old-growth forest potential represent a minor fraction of the timberland. Timberland with habitats for wildlife that need seclusion and timberland with old-growth and wildlife potential occur mostly in bottomlands along the Mississippi alluvial plain.
- Public agencies have increased their landholdings by 30 percent to 1,330,700 acres since 1974; most of the recent acquisitions have been bottomland hardwood stands. Forest industry landholdings have declined 4 percent to 3,603,100. Other private landholdings declined 8 percent to 8,938,800 acres.
- Timberland acreage has declined chiefly in bottomland hardwoods. In pine types, shifts in stand dominance have favored loblolly and slash over shortleaf and longleaf forest types in sawtimber stands. Sapling-

seedling stand increases have occurred only in loblolly pine. Shifts have occurred in hardwood forest types from oak-pine to oak-hickory.

INTRODUCTION

This document presents findings from the fifth periodic forest survey of Louisiana's timberland. Information covers the nontimber values of timberland (water quality maintenance, soil retention, range or livestock potential, wildlife habitat, and recreation opportunities). A companion report, Resource Bulletin SO-130 (Rosson, McWilliams, and Frey 1988), discusses the forest resource in terms of timber values.

The trend data available on nontimber values of timberland are limited, but useful comparisons can be derived from earlier surveys conducted in 1936 (Winters and others 1943), 1954 (U.S. Department of Agriculture 1955), 1964 (Sternitzke 1965), and 1974 (Murphy 1975), and, where noted, studies conducted by other agencies.

While Louisiana's timberland provides important timber value that bolsters the State's economy, not all timberland can be used exclusively to supply wood products. Forest management and planning that consider only timber values overlook hidden expenses in terms of other values foregone. Other land needs may also reduce the availability of forest resources for timber production. Further, some of the other values of timberland, known collectively as nontimber values, contribute to the State's economy. Timberland areas managed for commodities in addition to timber (e.g., livestock) can have greater value than those managed strictly for timber production, particularly when wood market prices are unstable. Noncommodity outputs of timberland (e.g., water quality, aesthetics) are important to the tourism industry, enhance the standard-of-living of local communities, and play a role in attracting and maintaining regional industries, particularly those in the service sector and other industries not tied to timber production.

Other forest values are examined in terms of physical and socioeconomic attributes as well as the more traditional forest survey estimates of area, volume, and stand structure characteristics of timberland. Definition of terms used in the text, estimates of statistical reliability, a species list, species occurrence data, and estimates of relative importance are tabulated in the Appendix.

BACKGROUND

This report focuses on nontimber values of Louisiana's timberland as recorded in surveys between February 1983 and February 1985. Such surveys, originally mandated by the McSweeney-McNary Act of 1928, provide basic periodic assessments of the Nation's public and private forest resources. More recent legislation, the Forest and Rangeland Renewable Resources Planning Act of 1974 and the Forest and Rangeland Renewable Resources Research Act of 1978, mandated that the Forest Service make and keep current comprehensive assessments of forested areas, thereby broadening the survey to consider nontimber values.

For forest survey purposes, Louisiana is subdivided into five units (fig. 1): North Delta, South Delta, Southwest, Southeast, and Northwest. Within each unit are permanent survey plots that have been distributed systematically throughout the State on a three-mile square grid. In this Statewide survey, 4,471 plots were visited. Of these, 2,365 plots were forested and were sampled for detailed tree and plot-level information. Approximate plot locations are illustrated in figure 2.

The total land base for Louisiana is 28,493,700 acres. Of this, 14,611,000 acres are classified as agriculture,

urban, residential, highways and other rights-of-way, and small wooded lots or strips too small or narrow to meet forest survey definitions. The remaining 13,882,700 acres are forested, with 10,100 of these acres classed as productive-reserved. Productive-reserved timberland occurs in Claiborne, Natchitoches, Rapides, Webster, and Winn parishes. This leaves 13,872,600 acres of Louisiana land classed as timberland.

WATER AND SOILS

Timberland is important to sustain soil productivity and water quality values in Louisiana. In some areas of the State, forest cover is essential to mitigate soil loss on land with high erosion potential, to reduce streamwater turbidity and temperature changes that harm fish and other aquatic species, and to limit downstream flooding. Louisiana's major land resource areas (fig. 3) are reflected in the general physical properties of land in the State. Potential soil erosion rates are highest for the Southern Mississippi Valley Uplands. The Western and Central Coastal Plains have moderate erosion potential, while the Western Gulf Coast Flatwoods have low erosion potential. Potential soil erosion rates are negligible for the remaining land resource areas.

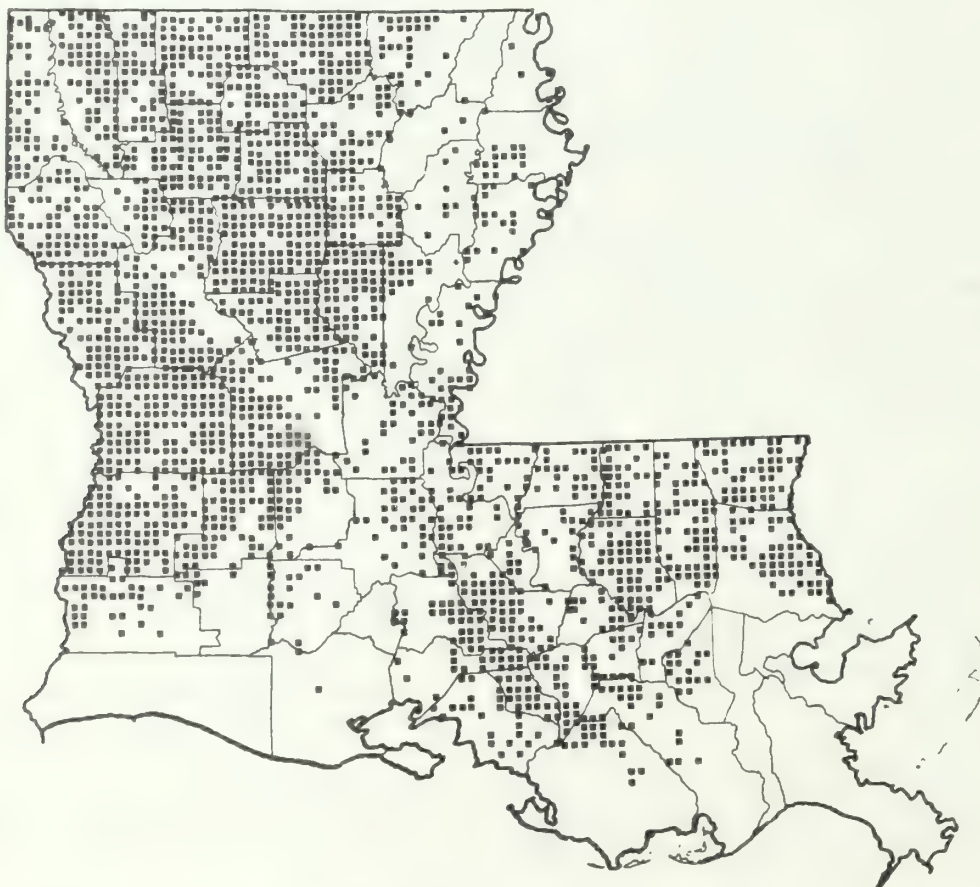


Figure 2.—Forest plot locations, Louisiana, 1984.

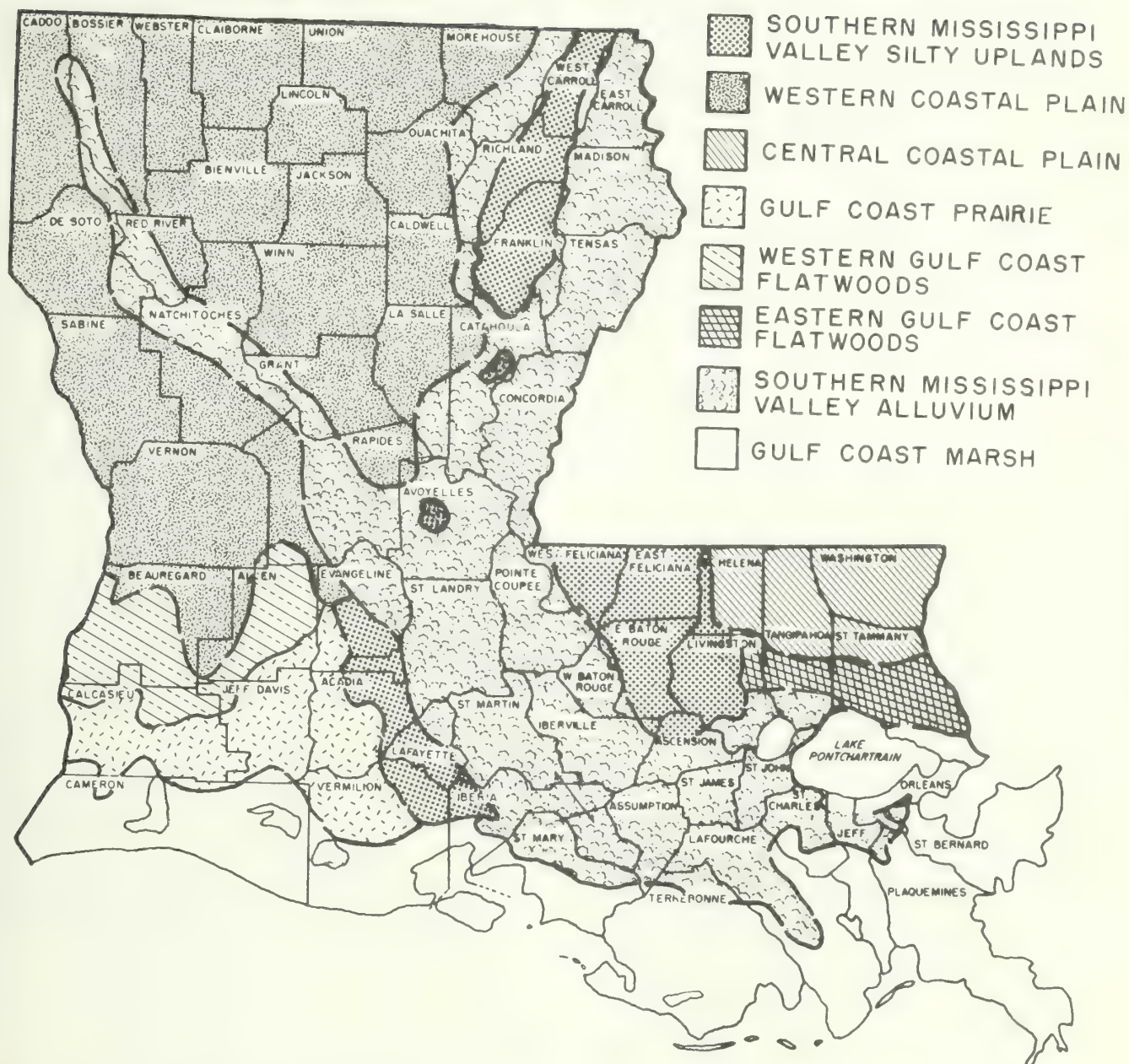


Figure 3.—Major land resource areas, Louisiana, (SCS, 1984).

Timberland with steep terrain may be unavailable for timber production because many of the standing trees, along with understory vegetation, are needed to retain soil, reduce surface runoff, and filter water for underground water recharge. Significant topsoil and nutrient losses and damage to streams can occur during the time normally required for natural revegetation of harvested areas. Even moderate erosion on some marginal soils can result in long-term loss of soil productivity (SCS 1984). Intensive site preparation on such fragile soils is not recommended, but clearcutting is possible without significant loss to water quality by using recommended practices such as retention of vegetation strips along catchments, carefully placed skidder roads and landings, and leaving slash onsite (McClurkin and others 1985).

Statewide, forest cover on steep terrain contains only a fraction of the timber. Approximately 3 percent of the State's timberland and growing-stock volume are on slopes greater than 15 percent (table 1). Growing-stock volume in these areas represents 620 million cubic feet, of which softwood saw-log volume accounts for 261 million cubic feet (42 percent). Setting aside these steep areas from timber production could alleviate some of the need to retain nontimber values, thereby freeing other areas for more intensive timber management.

The seven parishes of Caldwell, Catahoula, DeSoto, Rapides, Sabine, Union, and Vernon account for three-fourths of the 68,000 acres of forest land identified by the Soil Conservation Service (SCS) as having erosion problems (SCS 1984). Catahoula Parish has 37 percent of its timberland on slopes greater than 15 percent. The remaining six parishes have between 2 and 7 percent of timberland on slopes exceeding 15 percent.

Cropland areas where soils, terrain, and land use practices combine to create erosion problems have been identified by the Soil Conservation Service (fig. 4). The areas most susceptible to erosion are in the Southeast, Southwest, and North Delta survey units. Conservation measures, such as converting cropland to forest land, leaving residues on the soil surface in the autumn, and planting cover crops for wildlife, can reduce erosion in

the problem areas. Erosion control programs in these areas would be far more effective than programs applied to other parts of the State.

RANGE

Farmers have traditionally used forests for grazing and as seasonal shelter for livestock. Many farmers who own timberland also have permitted livestock grazing with little regard for timber production (Byington and others 1983). Transitional timberland areas—those on timberland but adjacent to pastureland—are areas where such practices are common.

Mosher (1984) states that growing timber and livestock together offers potentially more income per acre and helps stabilize income by providing more market production options. This "double-cropping" requires more intensive management, however. Occasional use of timberland by livestock benefits older stands by reducing understory competition and providing organic fertilizer. Monitoring to avoid excessive soil compaction and tree bole damage is needed. Timber harvesting, grazing, and prescribed fires need to be carefully scheduled to permit adequate regeneration. Additional guidelines and procedures for managing southern pine forests for both livestock and timber production have been prepared (see Byrd and others 1984).

The potential for timber production in combination with existing livestock production is greatest in Southwest Louisiana, where more than two-thirds of the farm owners use forested areas for livestock grazing (Byington and others 1983). A detailed survey of the Southwest unit in 1974 indicated that half of the timberland was grazed by livestock (Sternitzke and Pearson 1974). Most woody and non-woody plant utilization on this timberland was light; i.e., less than 35 percent of the plants were grazed. The longleaf-slash forest type was used more often for grazing (73 percent) than loblolly-shortleaf (56 percent), oak-pine (48 percent), oak-hickory (48 percent), or bottomland types of oak-gum-cypress and elm-ash-cottonwood (41 percent.)

Table 1—Area of timberland and growing-stock volume by slope class, Louisiana, 1984¹

Slope class	Area	Volume per acre	Volume		
			Total	Softwood	Hardwood
<i>Percent</i>	<i>Thousand acres</i>	<i>Cubic feet</i>	<i>Million cubic feet</i>		
0-5	10,885.8	1,378	15,003.9	7,766.7	7,237.2
6-10	1,930.3	1,337	2,580.6	1,837.9	742.7
11-15	593.6	1,327	787.5	591.7	195.8
16-20	255.3	1,323	337.8	205.6	132.2
over 20	207.6	1,359	282.2	150.0	132.2
Total	13,872.6	1,369	18,992.0	10,552.0	8,440.0

¹Rows and columns may not sum to totals due to rounding.

WILDLIFE

Timberland attributes associated with wildlife include the presence of diverse food plants, adequate nesting and foraging areas, and suitable cover from predators. The fruit of oak, hickory, beech, gum, cherry, ash, and other tree and shrub species, are important food sources for many wildlife. Trees that bear nuts (hard mast) are most likely to be critical to several game and non-game wildlife species during the fall and winter months. Many large birds of prey, such as bald eagles and barred owls, and mammals, such as black bears, require large trees for nesting, perching, or dens. Live trees with large, dead

sections are also important nesting areas for cavity-dwelling birds. Dead and dying trees provide feeding and nesting areas for woodpeckers and nesting areas for other mammals.

Oaks comprise the majority of nut-bearing tree species in Louisiana. Acorns are the most common food sources for white-tailed deer, squirrel, and turkey. Production of acorns and other nuts varies by tree species and diameter class. Other factors, such as crown class, are also important to mast production (Goodrum and others 1971). Bluebeech dominates in the 1.0- to 4.9-inch diameter class while water oak dominates in larger diameter classes. Other nut-bearing trees species are

Table 2. — *Number of live trees of nut-bearing species on timberland by species and diameter class, Louisiana, 1984¹*

Species	Diameter class (inches at breast height)					
	All classes	1.0-4.9	5.0-10.9	11.0-14.9	15.0-20.9	21.0 and larger
Oaks	<i>Thousand trees</i>					
White oak group						
Post	148,179	114,426	25,196	5,586	2,529	441
White	132,565	100,918	23,224	5,377	2,470	576
Overcup	43,852	26,236	9,387	3,668	2,948	1,614
Swamp chestnut	21,689	16,832	2,595	931	803	529
Delta post	686	...	542	65	62	17
Chestnut	541	541	...	...	...	...
Chinkapin	56	...	...	...	36	20
Swamp white	41	...	...	...	23	18
Total	347,609	258,953	60,944	15,627	8,871	3,215
Red oak group						
Water	275,330	220,735	35,520	9,736	5,911	3,428
Southern red	175,308	128,742	34,731	7,925	3,367	542
Willow	96,024	68,632	17,184	5,268	3,137	1,803
Laurel	71,780	57,854	8,964	2,050	2,008	904
Cherrybark	69,020	49,987	12,522	3,265	2,241	1,005
Blackjack ²	44,881	37,734	6,794	337	...	15
Nuttall	16,666	7,436	4,910	1,807	1,400	1,114
Black	16,358	14,721	1,337	219	68	15
Live ²	4,301	2,377	1,378	178	214	153
Bluejack ²	3,760	3,152	574	...	34	...
Shumard	2,280	1,363	579	138	156	44
Pin	137	...	...	120	...	17
Total	775,845	592,733	124,493	31,043	18,536	9,040
All oaks	1,123,454	851,686	185,437	46,670	27,407	12,255
Hickories						
Water	93,507	67,816	17,882	4,696	2,335	777
Pecan	12,742	6,959	4,038	876	633	236
Other	134,695	108,214	19,149	4,803	2,099	431
All hickories	240,944	182,989	41,069	10,375	5,067	1,444
Bluebeech ²	303,946	276,099	26,056	1,757	34	...
Ironwood ²	176,134	170,227	5,791	116	...	...
American beech	25,134	14,740	3,975	2,334	2,504	1,581
Chinkapin	8,509	8,509	...	...	...	...
Black walnut	317	...	304	...	...	14
All species	1,878,438	1,504,250	262,632	61,252	35,012	15,294

¹Rows and columns may not sum to totals due to rounding.

²Noncommercial species.

presented by diameter class and detailed species in table 2. Information on the diameter distribution of other mast-bearing tree species (e.g. persimmon, dogwood, cherry) can be found in the timber report (Rosson and others 1988).

A few tree species such as bluebeech produce nuts when small. Most acorns are produced when oaks attain sawtimber size. The distribution of nut-bearing tree species of sawtimber size is presented by species and forest survey unit (table 3). At the State and unit level, water oak is the dominant nut-bearing species, except in the North Delta unit, where overcup oak, willow oak, and water hickory are more frequent. Regionally, more nut-bearing tree species of sawtimber size occur in the Southwest and Northwest survey units.

Most large live trees, those 21 inches or more in

diameter, are found in bottomlands (oak-gum-cypress and elm-ash-cottonwood forest types), rather than in pine forest types (longleaf-slash and loblolly-shortleaf forest types) (table 4). In pine forest types, large live trees are rare in plantations (16 trees per 100 acres) when compared with natural pine stands (153 trees per 100 acres). Among owners, forest industries own the least number of large live trees (182 trees per 100 acres) relative to other private individuals (273 trees per 100 acres) and public agencies (367 trees per 100 acres).

The red-cockaded woodpecker, one of the endangered species more extensively studied, depends upon live pine trees in stands averaging 60 years or more, and in relatively pure pine stands with a limited hardwood understory (Lennartz and others 1983b). Such stands are rare because many pine stands are harvested within

Table 3. — Number of live sawtimber trees of nut-bearing species by species and forest survey units, Louisiana, 1984¹

Species	Statewide	Forest survey units				
		North Delta	South Delta	Southwest	Southeast	Northwest
Oaks	Trees per 1000 acres					
White oak group						
Post	617	192	128	764	342	933
White	607	462	52	722	394	908
Overcup	593	2,372	815	268	143	610
Swamp chestnut	163	58	115	198	358	99
Delta post	10	110	...	...	...	10
Chinkapin	4	...	...	...	32	...
Swamp white	3	...	...	4	...	5
Total	1,997	3,194	1,110	1,956	1,269	2,565
Red oak group						
Water	1,375	1,360	1,441	1,001	2,018	1,462
Southern red	853	359	10	1,158	371	1,300
Willow	736	1,987	199	397	285	1,287
Cherrybark	469	324	275	434	491	632
Laurel	358	114	85	439	1,325	90
Nuttall	311	1,326	844	124	...	123
Live ²	39	...	189	3	48	...
Blackjack ²	25	...	...	54	...	26
Shumard	24	...	12	22	...	48
Black	22	88	18	5	14	30
Pin	10	...	20	4	41	...
Bluejack ²	2	...	...	...	...	8
Total	4,224	5,558	3,093	3,641	4,593	5,006
All oaks	6,221	8,752	4,203	5,597	5,862	7,571
Hickories						
Water	563	1,833	1,117	309	272	369
Pecan	126	600	282	94	...	24
Other	529	193	262	480	493	806
All hickories	1,218	2,626	1,661	883	765	1,199
American beech	463	252	60	747	510	422
Bluebeech ²	129	...	57	177	424	29
Ironwood ²	8	...	...	26	...	...
Black walnut	1	...	...	...	...	3
All species	8,040	11,630	5,981	7,430	7,561	9,224

¹Rows and columns may not sum to totals due to rounding.

²Noncommercial species.

Table 4.—*Number of large diameter live trees on timberland by diameter class and forest type, Louisiana, 1984*

Forest type	Diameter class (inches at breast height)					
	Total	21.0–22.9	23.0–24.9	25.0–26.9	27.0–28.9	29.0 and larger
	<i>Trees per 100 acres</i>					
Longleaf-slash	25	9	12	1	...	3
Loblolly-shortleaf	133	73	33	15	6	5
Oak-pine	200	90	54	23	15	19
Oak-hickory	188	70	51	28	15	24
Oak-gum-cypress	477	188	112	62	46	70
Elm-ash-cottonwood	382	159	87	48	32	57
All types	259	109	64	33	21	32

50 years of establishment or hardwood control measures such as periodic low intensity fires have been eliminated. Further, a few studies have suggested that optimum conditions for red-cockaded woodpeckers occur in mature longleaf pine forest stands rather than other pine forest stands (Lennartz and others 1983b, Seagle and others 1987). Thus timber management preferences for other pines in stand regeneration over longleaf is seen as a contributor to the decline in red-cockaded populations.

Individual habitats of active red-cockaded woodpecker colonies have been estimated on Federal lands. Nesting colonies in Louisiana are believed to occur in the Kisatchie National Forest, Fort Polk Military Base, and D'Arbonne National Wildlife Refuge (Lennartz and others 1983a). Together, these areas represent all of the known red-cockaded woodpecker colonies in Louisiana (Gary Lester, Louisiana Natural Heritage Program, Baton Rouge, LA, personal communication). The State's red-cockaded woodpecker nesting habitat was estimated in 1974 at 59,000 acres. For the 1984 survey, the estimate is 79,000 acres — a negligible difference when sampling error is considered.

Black bears in Louisiana currently prevail in small, isolated bottomland hardwood stands (fig. 5). Most of these areas are relatively inaccessible to people and contain large tracts of timberland with suitable food plants and escape cover. Hunting pressure (mainly through poaching) and harassment by dogs and humans have probably restricted the potential for black bears to increase their range and population numbers (Lauren Hillman, USDA-Forest Service, National Forests in North Carolina, Asheville, NC, personal communication 1986). The fragmentation of hardwood stands and loss of bottomland hardwoods to agricultural uses have also contributed to the restricted area of suitable black bear habitat (Brunett and others 1975).

Other cavity-nesting birds and mammals depend upon snags, i.e., standing dead and dying trees, for shelter or as foraging areas. Because the number, size, and quality of snags needed by cavity-nesters vary by tree species, forest type and other forest conditions, users may wish to obtain more detailed data from the Forest Inventory and Analysis Unit to categorize habitats for individual cavity-nesting species. General information on snags is presented to provide an overview of data available.

Snag data are derived from timber-oriented inventories; some snags can be classed as rotten trees. Most snags are salvable dead or standing nonsalvable dead trees. Rotten trees are live trees of commercial species with reduced timber value primarily due to rot. Salvable dead trees are dead trees of commercial species that still have some merchantable timber volume. In Louisiana's climate, salvable dead trees are almost always standing trees. Standing nonsalvable dead trees are dead trees of any species that remain standing and have decay advanced to the point where there is no merchantable timber volume.

Rotten, salvable, and standing nonsalvable dead trees occur in all size classes, even in small diameter classes. Rotten trees are more commonly found in the hardwood forest types (oak-hickory, oak-gum-cypress, and elm-ash-cottonwood) than in the pine forest types (table 5). Hardwood forest types also contain more of the large diameter class dead trees (table 6). Salvable dead trees of small diameter class are generally more frequent in pine and oak-pine forest types than other forest types (table 7). Standing nonsalvable dead trees are more frequent in hardwood stands, regardless of diameter class (table 8).

Rotten trees are not as frequent on forest industry land (261 trees per 100 acres), as on public (412 trees per 100 acres) or other private timberland (335 trees per 100 acres). Public timberland contains more rotten trees, on average, regardless of forest type. As one might expect, salvable and standing nonsalvable dead trees are less frequent on timberland owned by forest industries (398 trees per 100 acres) than public timberland (513 trees per 100 acres) or other private timberland (565 trees per 100 acres). Other private timberland contains a greater frequency of standing nonsalvable dead trees, regardless of forest type (table 9).

The patterns above are not surprising. Others have noted the reduced number of snags in pine stands (Harlow and Guynn 1983). Common management practices associated with pine timber production, such as clearcutting and short rotations, limit dead and rotten tree retention. Stand conversion from oak-pine and oak-hickory to pine types has the potential for increasing the number of hardwood snags where unwanted rough and rotten hardwoods are killed but allowed to remain standing.



Figure 5.—Range of black bears in Louisiana (Louisiana Department of Wildlife and Fisheries, 1985).

Table 5. — *Number of rotten trees on timberland by diameter class and forest type, Louisiana, 1984*

Forest type	Diameter class (inches at breast height)					
	Total	5.0- 8.9	9.0- 12.9	13.0- 16.9	17.0- 20.9	21.0 and larger
<i>Trees per 100 acres</i>						
Longleaf-slash	58	58	...	...	...	...
Loblolly-shortleaf	131	63	30	16	12	10
Oak-pine	202	20	64	54	37	26
Oak-hickory	369	167	73	49	39	41
Oak-gum-cypress	572	199	134	92	62	85
Elm-ash-cottonwood	510	285	87	84	32	22
All forest types	323	122	74	51	35	40

Table 6. — *Number of dead trees on timberland by diameter class and forest type, Louisiana, 1984*

Forest type	Diameter class (inches at breast height)					
	All classes	5.0- 8.9	9.0- 12.9	13.0- 16.9	17.0- 20.9	21.0 and larger
<i>Trees per 100 acres</i>						
Longleaf-slash	465	327	104	27	7	...
Loblolly-shortleaf	435	303	80	36	12	4
Oak-pine	506	294	138	54	14	6
Oak-hickory	565	395	94	50	13	13
Oak-gum-cypress	587	317	136	75	31	27
Elm-ash-cottonwood	534	230	173	67	28	36
All forest types	517	320	112	53	18	14

Table 7. — *Number of salvable dead trees on timberland by diameter class and forest type, Louisiana, 1984*

Forest type	Diameter class (inches at breast height)					
	All classes	5.0- 8.9	9.0- 12.9	13.0- 16.9	17.0- 20.9	21.0 and larger
<i>Trees per 100 acres</i>						
Longleaf-slash	318	255	46	13	5	...
Loblolly-shortleaf	176	142	19	10	3	2
Oak-pine	200	138	30	23	8	1
Oak-hickory	159	124	17	9	7	3
Oak-gum-cypress	77	42	14	11	7	3
Elm-ash-cottonwood	65	...	52	11	...	3
All types	151	110	21	12	6	2

Table 8. — *Number of standing non-salvable dead trees on timberland by diameter class and forest type., Louisiana, 1984*

Forest type	Diameter class (inches at breast height)					
	All classes	5.0- 8.9	9.0- 12.9	13.0- 16.9	17.0- 20.9	21.0 and larger
<i>Trees per 100 acres</i>						
Longleaf-slash	147	72	58	15	2	...
Loblolly-shortleaf	259	162	62	25	8	2
Oak-pine	306	156	108	31	6	5
Oak-hickory	406	272	77	41	6	10
Oak-gum-cypress	510	275	123	65	24	24
Elm-ash-cottonwood	468	230	121	56	28	33
All types	366	210	91	41	13	12

Table 9. — *Number of rotten, salvable dead, and standing non-salvable dead trees 5.0 inches or more in diameter on timberland by forest type and ownership class, Louisiana, 1984*

Forest type and ownership class	Total	Rotten	Salvable dead	Standing non-salvable dead
<i>Trees per 100 acres</i>				
a. Pine (longleaf-slash and loblolly-shortleaf)				
Public	522	123	160	239
Forest industry	458	116	133	209
Other private	625	117	252	256
All owners	557	117	202	238
b. Upland hardwood (oak-pine and oak hickory)				
Public	1,068	412	343	313
Forest industry	719	300	141	278
Other private	857	272	179	406
All owners	828	291	178	359
c. Bottomland hardwood (oak-gum-cypress and elm-ash-cottonwood)				
Public	1,190	651	60	479
Forest industry	1,111	593	35	483
Other private	1,148	548	85	515
All owners	1,149	566	76	507
d. All forest types				
Public	925	412	155	358
Forest industry	659	261	119	279
Other private	900	335	163	402
All owners	840	323	151	366

RECREATION AND OTHER VALUE INTERACTIONS

The Louisiana landscape is dominated by forests. Lakes, rivers, bayous, and air-conditioned facilities may be the features sought when people plan outings, but Louisiana's humid climate and relatively hot summers make forests a most important year-round focus of outdoor recreation activities.

Unlike many regions with popular recreation areas, Louisiana has few locations with steep topography or rugged terrain (see table 3). However, the relatively flat forested bayous of the Mississippi and Atchafalaya Rivers are some of the prime sightseeing areas that attract tourists to Louisiana. The potential for development of old-growth stands—a rare site in the Midsouth states—is very great. Most of the State's old-growth stands have been cut in the past, but some stands remain relatively undeveloped and have reverted to a semi-wild status. Approximately 1 percent of the timberland (131,000 acres) contains a majority stocking of large-diameter trees (21 inches d.b.h. and larger). Eighty-seven percent of these stands are bottomland hardwood forests; half are in the Delta units. The ivory-billed woodpecker, thought by many to be extinct in the United States, was last reported to be in the old-growth bottomland forests of Louisiana. In the future, selectively managed stands with old-growth potential may provide suitable habitat for reintroducing the ivory-billed woodpecker and help

retain habitats for other endangered and potentially threatened species dependent on old-growth forests.

Remoteness

Remote timberland areas are limited throughout the Midsouth (Rudis 1986). These areas are important to recreationists because they provide a sense of "wilderness." Black bears and other wildlife in need of seclusion depend upon remote areas as well.

Estimates of remote timberland areas in Louisiana come from two parameters—forest size and distance from roads. Forest size is classified by tract size or area of contiguous forest land. Tracts are not defined by ownership boundaries but by nonforest uses exceeding 120 feet in width. Distance of timberland from roads is determined as the distance from the nearest all-weather road (improved and maintained) or unimproved, truck-operable road. (These parameters can also be used in assessing timber availability. Small tracts may be uneconomical for harvesting. Timberland in remote locations may require helicopters, an intensive road-building effort, or other specialized equipment.)

Timberland in tracts of 2,500 acres or more represents 43 percent of the State's timberland area and 47 percent of its growing-stock volume (table 10). Less than 4 percent of the timberland is fragmented into tracts 50 acres or less (table 10). Most of this timberland is widely dispersed, with the exceptions of southeastern Louisiana

and the predominantly agricultural portion of the State (fig. 6). By forest type, 40 percent of timberland in tracts 2,500 acres or more is oak-gum-cypress, with the remaining 60 percent in loblolly-shortleaf (25 percent), oak-hickory (12 percent), oak-pine (12 percent), longleaf-slash (8 percent), and elm-ash-cottonwood (4 percent) (table 11).

Timberland ½ mile or more from roads represents 2.5 million acres (17 percent statewide), and 4.0 million cubic feet of growing-stock volume (21 percent Statewide). Timberland that is distant from roads and is part of large tracts is found chiefly in the Atchafalaya Basin and in scattered locales throughout the Mississippi River Valley (fig. 6). Most of these areas (77 percent) are in bottomland hardwood forest types, compared with 12 percent in oak-pine and oak-hickory, and 10 percent in pine forest types.

The majority of timberland, 83 percent, is accessible, being within ½ mile of roads. Softwoods comprise the majority of growing stock on accessible timberland; hardwoods represent the majority on less accessible timberland (table 12). Timberland 1 mile or more from roads comprises 9 percent of the total and is found chiefly in the Atchafalaya Basin.

Location

In addition to distance from roads, timberland's recreation value depends on proximity to population centers. Louisiana's population is concentrated in the southeastern part of the State (fig. 7) where 10-year projected population increases also are expected to be greatest (fig. 8). Timberland in or near densely populated and growing metropolitan areas is likely to be valued more for recreation and land development potential than for timber values.

Data aggregated by State planning region suggests a disparity in the variety and amount of acres of timberland available. Pine and upland hardwood forests are common in the northern regions; bottomlands are common in the southern regions (fig. 9). Public timberland acreage is relatively rare in southern regions when compared with northern regions; the proportion per State planning region ranges from 23 percent in Alexandria to 0 percent in Lake Charles. Other ownership classes are presented for comparison (table 13). There are 3.3 acres of timberland for each of the State's inhabitants. By regions, timberland per person ranges from 9.8 acres per person in Alexandria to 0.3 acre per

Table 10.—Area of timberland and growing-stock volume by size of forest tract, Louisiana, 1984¹

Size of forest tract	Area	Volume/acre	Volume		
			Total	Softwood	Hardwood
	Acres	Thousand acres	Cubic feet	Million cubic feet	
1-10	125.1	1,123	140.5	64.9	75.6
11-50	381.5	1,074	409.7	198.3	211.4
51-100	402.3	1,068	429.5	209.4	220.1
101-500	1,964.4	1,195	2,347.8	1,322.0	1,025.8
501-2,500	5,026.8	1,336	6,717.1	4,083.6	2,633.5
2,501-5,000	2,965.1	1,486	4,406.7	2,457.8	1,948.9
More than 5,000	3,007.5	1,510	4,540.7	2,216.0	2,324.7
All sizes	13,872.6	1,369	18,992.0	10,552.0	8,440.0

¹Rows and columns may not sum to totals due to rounding.

Table 11.—Area of timberland by forest type and size of forest tract, Louisiana, 1984¹

Forest type	Size of forest tract (acres)							
	All classes	1-10	11-50	51-100	101-500	501-2,500	2,501-5,000	More than 5,000
	Thousand acres							
Longleaf-slash	933.2	0.0	12.1	12.4	71.2	376.4	195.7	265.4
Loblolly-shortleaf	4,033.2	34.3	109.4	83.8	661.3	1,642.9	887.8	613.8
Oak-pine	1,913.3	0.0	40.8	52.3	259.4	877.9	382.2	300.6
Oak-hickory	2,170.7	18.3	57.7	90.6	359.1	930.1	508.0	206.9
Oak-gum-cypress	4,377.6	58.7	125.8	146.9	542.4	1,141.0	925.0	1,437.7
Elm-ash-cottonwood	412.4	13.8	30.2	11.1	71.0	58.4	58.2	169.6
All types ²	13,840.2	125.1	376.0	397.1	1,964.4	5,026.7	2,956.9	2,994.0

¹Rows and columns may not sum to totals due to rounding.

²Does not include 32,400 acres of nontyped timberland.

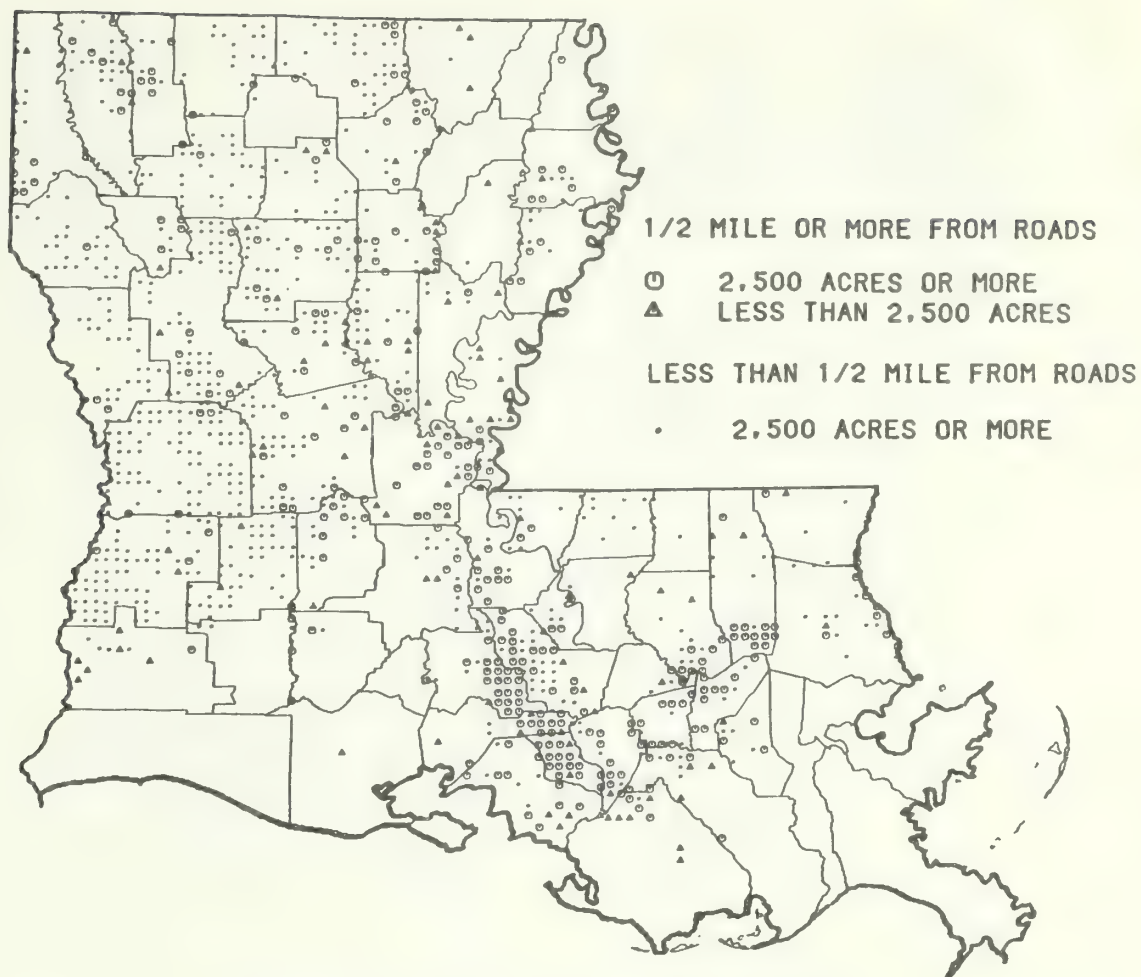


Figure 6.—Remote timberland by forest size and distance from roads, Louisiana, 1984.

Table 12.—Area of timberland and growing-stock volume by distance from roads, Louisiana, 1984

Distance from roads	Volume				
	Area	Volume/acre	Total	Softwood	Hardwood
	<i>Thousand acres</i>	<i>Cubic feet</i>		<i>Million cubic feet</i>	
0-649 feet	5,683.8	1,227	6,971.5	4,823.0	2,148.4
650-1,349	3,309.8	1,371	4,537.7	2,631.4	1,906.4
1,350-2,649	2,486.0	1,472	3,658.9	1,635.6	2,023.3
2,650-3,949	784.4	1,672	1,311.6	513.9	797.7
3,950-5,249	404.8	1,636	662.3	269.5	392.7
5,250-<3 miles	846.1	1,584	1,340.6	499.2	841.4
3 miles or more	357.8	1,424	509.4	179.3	330.1
Total	13,872.6	1,369	18,992.0	10,552.0	8,440.0

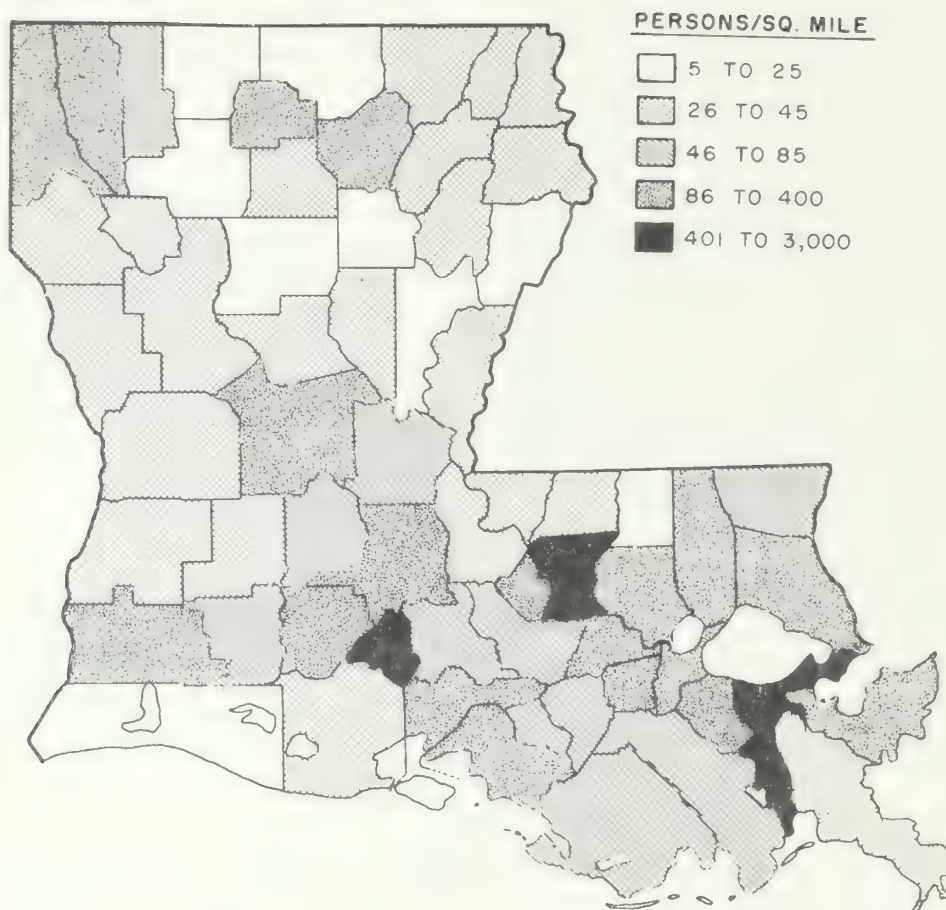


Figure 7.—Population density, Louisiana, 1985 (State Planning Office).

person in New Orleans. Many forest recreation enthusiasts of Lafayette, Houma, and New Orleans either make more use of their region's limited timberland, spend their time and money in more distant regions or adjacent states, or divert their leisure interests in forests with substitute activities on nontimberland areas.

Selected values associated with timberland have already been lost in the more densely populated regions. Several wildlife species that inhabit timberland (e.g., black bears, white-tailed deer) are absent or rare in urban areas. Aesthetics have also deteriorated. A special survey conducted in Southeast Louisiana indicates that 30 percent of the timberland contains artifacts associated with human use. Of the acres with one or more artifacts, 23 percent have beverage containers. Most timberland with artifacts is found near roads, urban areas, and agricultural fields. Improving aesthetics along roadsides and frequently used areas through education and litter clean-up efforts can alleviate some of these losses.

Activities

Among recreation uses closely associated with the recreation values of timberland are dispersed activities, such as hunting and camping. A 1984 inventory of

hunting facilities indicated that 2,700,000 acres are owned or leased for hunting activities. One-third is owned or leased by private hunting clubs; the remainder is held by public agencies (Louisiana Department of Culture, Recreation, and Tourism [DCRT] 1984). Although not all of the acreage can be classed as timberland, a rough estimate is 1,450,000 acres, or 10 percent of the State's timberland. Regionally, hunting areas are widely distributed, with half of the acreage in the North and South Delta Units and limited acreage near metropolitan areas (fig. 10).

A total of 3,000 acres of camping facilities exist in Louisiana (DCRT 1984). The land area is small, but its influence on timberland is nevertheless important. Trees provide essential shade and other amenities for campers. Timberland adjacent to camping areas is used for hunting, hiking, and aesthetic enjoyment. Such timberland also helps maintain water quality for fishing, boating, and other water-based activities in streams and nearby water bodies.

In contrast to hunting acreage, camping acreage is concentrated near major metropolitan areas, although the majority are for trailers rather than tents (fig. 11, 12, 13). Most private campgrounds provide spaces for trail-

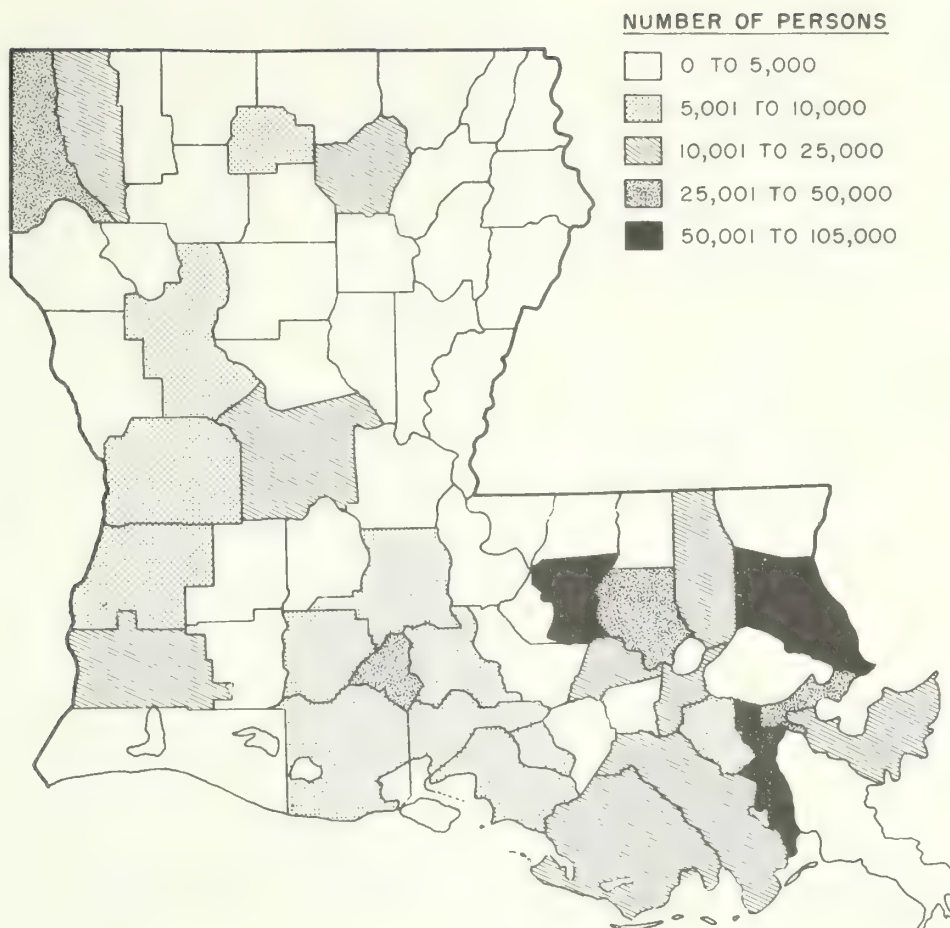


Figure 8.—Projected increase in parish populations, Louisiana, 1985-1995 (State Planning Office).

ers or vans; tent camping facilities are uncommon. Tent facilities are more frequent in public campgrounds.

The Louisiana Department of Culture, Recreation, and Tourism states that high priority needs exist for big game hunting areas in the regions of Monroe and Alexandria, and for camping facilities in the regions of Lake Charles and Lafayette (DCRT 1977). Supplying these needs may be a feasible timberland management option in the forested areas of these regions.

Aesthetics

The aesthetic, or landscape, value of Louisiana's timberland is particularly important to picnicking, sightseeing, fishing, and other off-site recreation activities. The design elements of seasonal color, shape, texture, and juxtaposition are important aspects of timberland areas (Crowe 1973). In Louisiana, seasonal color is relatively limited, especially in the southern parishes. Nevertheless, seasonal color affects a large number of outdoor enthusiasts as change coincides with major hunting seasons, and signals a short relief from the hot and humid conditions characteristic of Louisiana's climate. The vertical shape of most pines, coupled

with their fine-textured, dark evergreen foliage, creates a striking contrast to relatively flat landscapes. Live oak, dogwood, and some other hardwoods have horizontal branching patterns and coarser textures which soften vertical contrasts in otherwise pure pine stands. Juxtaposition of sapling and seedling stands against older sawtimber stands provides another contrast. Too frequent or infrequent occurrence of these elements creates monotony.

Design elements can be used effectively to enhance the value of timberland for aesthetics and other nontimber values, while mitigating their effect on timber benefits (Crowe 1973). Pine plantations established in rows adjacent to Louisiana's major thoroughfares have a strong visual impact on the landscape, and affect a large number of travelers. Rows that follow the subtle contours of the land augment needed topographic relief and reduce soil erosion during early stand establishment; rows that simply follow landowner boundaries or rights-of-way encourage uniformity. Retention of mature vegetation along water bodies or water courses within clearcuts and pine plantations creates a visual contrast as well as biological diversity and edge habitat for a variety of wildlife species. Nearby stands with abundant

SHREVEPORT

PINE	1.50
UPLANDS	1.59
BOTTOMLANDS	.45
TOTAL	3.55

MONROE

PINE	.58
UPLANDS	.53
BOTTOMLANDS	.76
TOTAL	1.88

ALEXANDRIA

PINE	1.37
UPLANDS	.92
BOTTOMLANDS	.79
TOTAL	3.09

BATON ROUGE

PINE	.58
UPLANDS	.59
BOTTOMLANDS	.97
TOTAL	2.11

LAKE CHARLES

PINE	.70
UPLANDS	.28
BOTTOMLANDS	.23
TOTAL	1.20

LAFAYETTE

PINE	.10
UPLANDS	.08
BOTTOMLANDS	.87
TOTAL	1.06

HOUMA

PINE	—
UPLANDS	—
BOTTOMLANDS	.60
TOTAL	.60

NEW ORLEANS

PINE	.20
UPLANDS	.10
BOTTOMLANDS	.10
TOTAL	.40

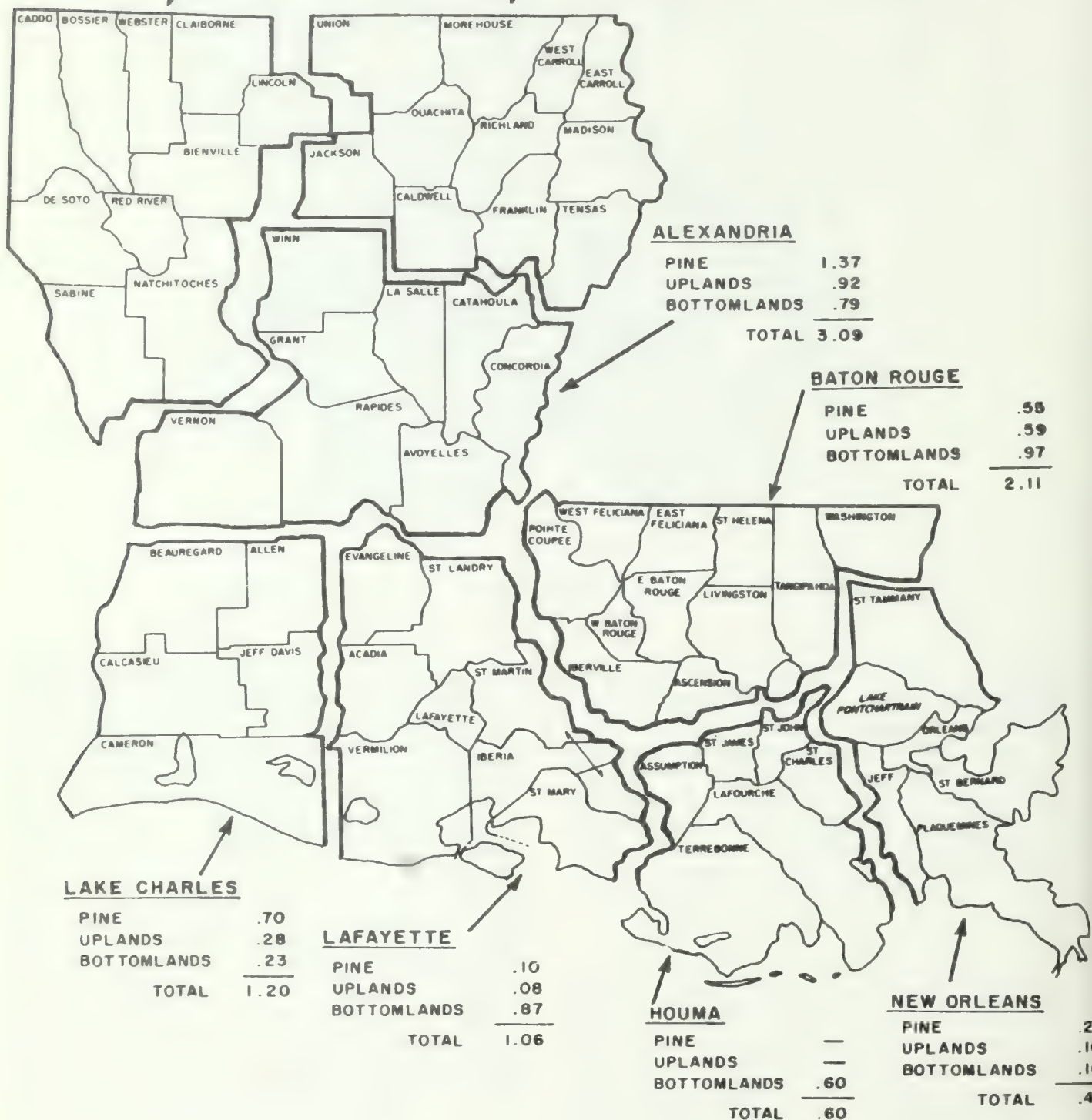


Figure 9.— Forest acres (in millions) by State planning regions and forest type, Louisiana, 1984. Pine includes loblolly-shortleaf and longleaf-slash forest types; uplands include oak-pine and oak-hickory forest types; bottomlands include oak-gum-cypress and elm-ash-cottonwood forest types.

Table 13.—Population, timberland area per person, and timberland area by ownership class and state planning region¹, Louisiana

State planning region	Population (U.S. Census 1980)	Timberland per person	Ownership class			
			All owners	Public	Forest industry ²	Other private
			Thousand acres			
Shreveport	551,258	6.43	3,545	264	942	2,340
Alexandria	316,378	9.76	3,088	702	1,386	1,000
Baton Rouge	716,288	2.94	2,109	58	553	1,498
Monroe	318,815	5.90	1,881	207	727	948
Lake Charles	259,809	4.64	1,204	...	491	713
Lafayette	540,592	1.96	1,058	77	74	907
Houma	289,638	2.16	627	4	25	598
New Orleans	1,213,122	0.30	361	20	72	269
Statewide	4,205,900	3.30	13,873	1,331	4,270	8,272

¹Rows and columns may not sum to totals due to rounding.

²Includes other private land leased to forest industries.

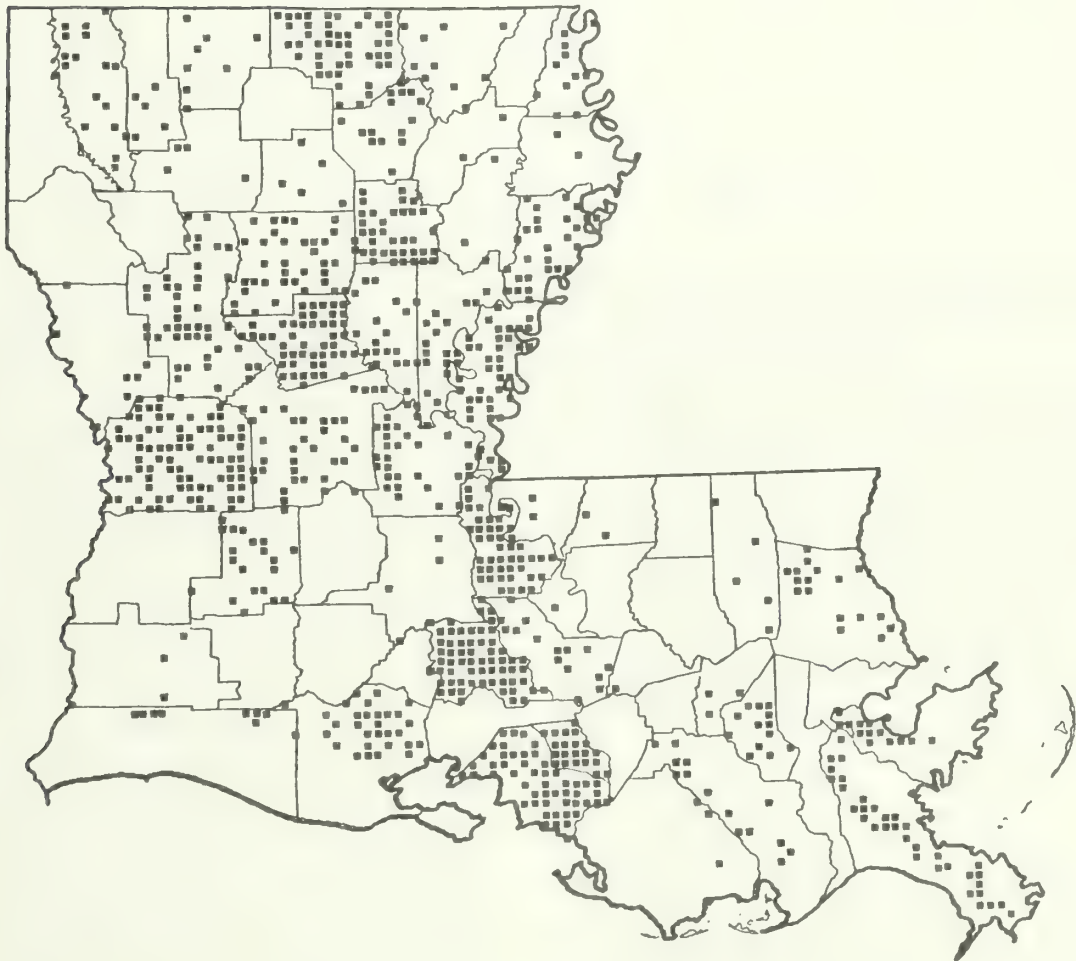


Figure 10.—Areas designated for hunting, Louisiana, 1984 (DCRT). Each dot represents 3,000 acres.

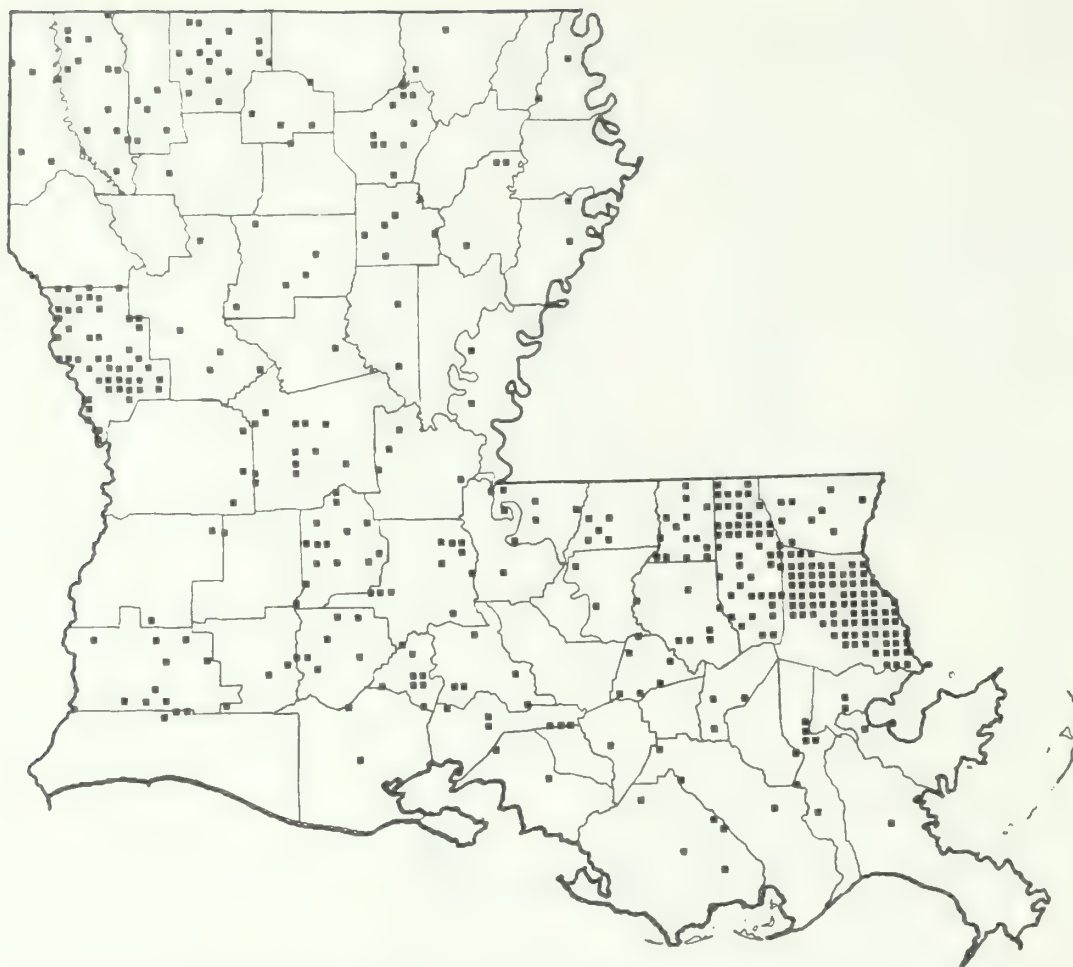


Figure 11.—Areas designated for camping, Louisiana, 1984 (DCRT). Each dot represents 7 acres.

snags, such as mature, unmanaged hardwood stands, greatly enhance the area's cavity-nesting bird habitat. Scheduling harvests in different years among adjacent timber stands promotes visual and biological diversity, supports a more continuous income to the landowner through periodic timber harvests, and reduces chances for wide fluctuations in water supplies and game habitats. Separating extensive acreages of pine plantations with non-forested areas also alleviates monotony (especially important along well-traveled roadways) and mitigates against catastrophic losses due to fire or pine beetle epidemics. Partitioning pine plantations with hardwood stands can also be used but care must be exercised to avoid conditions that promote fusiform rust and other diseases with alternate hosts by using disease-resistant hardwood and pine varieties.

TRENDS IN SUPPLY

Trends in nontimber values of timberland are closely linked to changes in ownership, forest area, and stand structure. Forest industry landholdings declined 4 percent since 1974 to 3,603,100 acres, and other private landholdings declined 8 percent to 8,938,800 acres. Recognizing the multiple forest values in timberland,

public agencies have increased timberland holdings by 30 percent in the past 10 years to 1,330,700 acres, or 10 percent of Louisiana's timberland acreage (Rosson and others 1988).

Total timberland has declined by 4.5 percent since 1974. Major losses were due to the clearing of bottomland hardwood (oak-gum-cypress and elm-ash-cottonwood) stands. Most of the recent public acquisitions have been in bottomland hardwood stands in the Delta Units where rapid conversion to agricultural uses intensified the need to conserve remaining timberland. While such a rapid conversion of timberland to agricultural uses is unlikely to continue, one might expect additional public acquisition of timberland as forests with abundant nontimber values become scarce.

In terms of stand structure, tables 14 and 15 present current acreages by forest type and stand size class, and changes that have occurred since the 1974 survey. There has been a net gain in sawtimber stands in pine forest types and a corresponding decline in poletimber stands because many of the pine poletimber stands have grown into the sawtimber size class (table 14). Shifts in stand dominance have favored loblolly and slash over shortleaf and longleaf pines in sawtimber stands. Sapling-seedling stand increases have occurred only in loblolly, suggesting

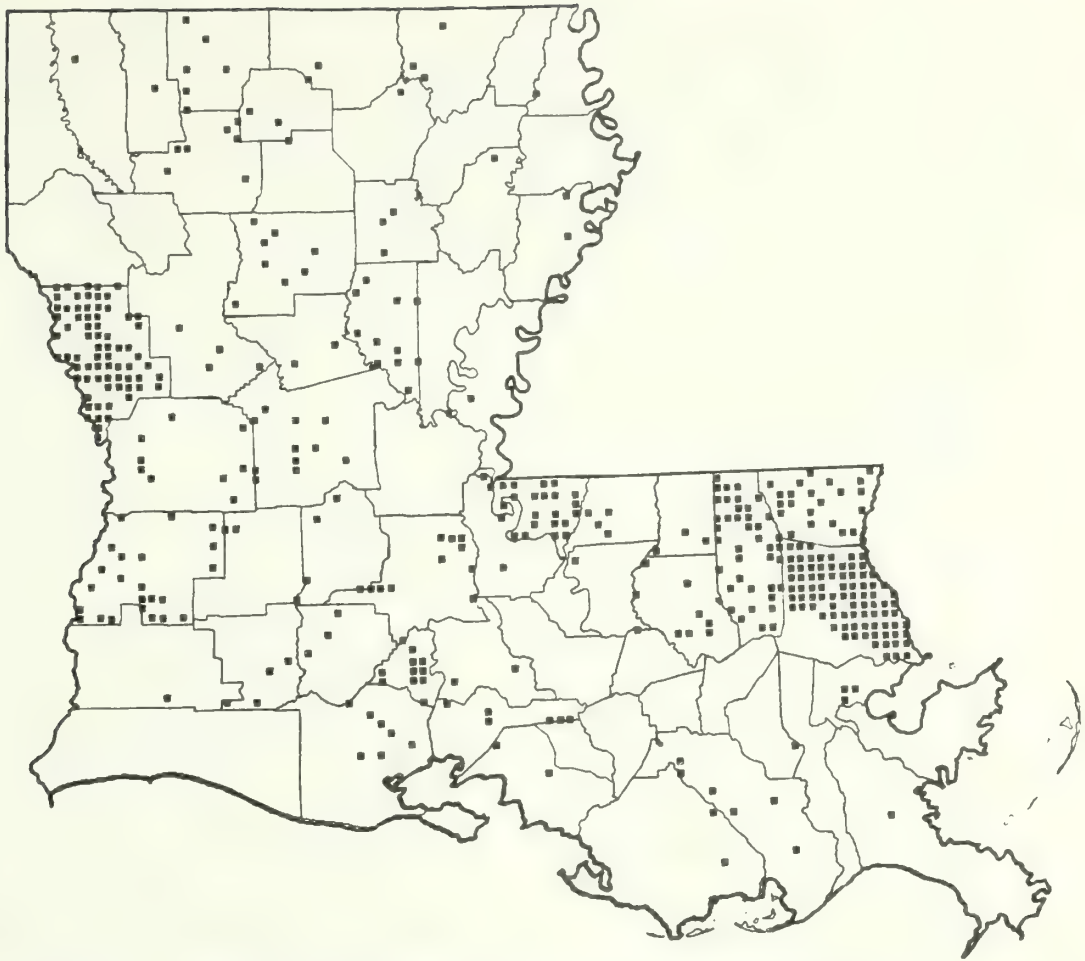


Figure 12.—Number of tent sites, Louisiana, 1984 (DCRT). Each dot represents 9 tent sites.

regeneration of loblolly is being favored over other pine types.

In hardwood forest types, there has been a net loss in sawtimber, poletimber, and sapling-seedling stands, largely due to declines in bottomland hardwood stands (table 15). Historically, the rapid reduction in Louisiana's bottomland hardwood stands for agricultural production is believed to have ended prior to 1980 (Rosson and others 1988). Gains in oak-hickory forest type, particularly in sawtimber and poletimber acreage, are linked to losses in oak-pine and some pine stands, suggesting selective removal of dominant pine trees is occurring without further pine timber management.

Timber production is expected to intensify in forests already managed for timber products. One can expect an increase in pine stands dominated by loblolly pine, along with a decline in other pine types. We can expect changes in wildlife habitat where extensive areas are clearcut and regenerated to pine. Young clearcuts of most any forest type increase the habitat for deer and other wildlife dependent on young forest vegetation; after 7 to 10 years the quality of the deer habitat on pine plantations deteriorates as non-pine vegetation dwindles (Dickson and Huntley 1985). One can also expect that much pine regeneration will be as plantations, with few

large live trees and even fewer mast hardwoods or large dead trees. Such areas are most likely to occur where pine forest types and exclusive timber management predominate.

Countering the trend toward intensified pine timber management is a shift of pine and oak-pine forest acres to stands dominated by hardwoods. With time, demand for other forest values, particularly recreation, can be expected to rise with an increase in Louisiana's population. Oak-pine, oak-hickory, and remaining bottomland hardwoods (oak-gum-cypress and elm-ash-cottonwood) are likely to increase in importance as forests with wildlife, recreation, and old-growth potential. Greater utilization of young and low-timber quality hardwoods (e.g., for fuel or fiber) would limit future prospects for hardwood stands to retain mast, snag, and older trees with nontimber values.

Many of the longer-term historical changes in timberland acreage, stand structure, and future prospects for Louisiana's forest resources have been addressed elsewhere (Rosson and others 1988, Rudis and Birdsey 1986). Import restrictions, changes in forestry tax incentives, and other programs designed to alter the economics of timber production also have an effect on nontimber values. To what degree these policies or

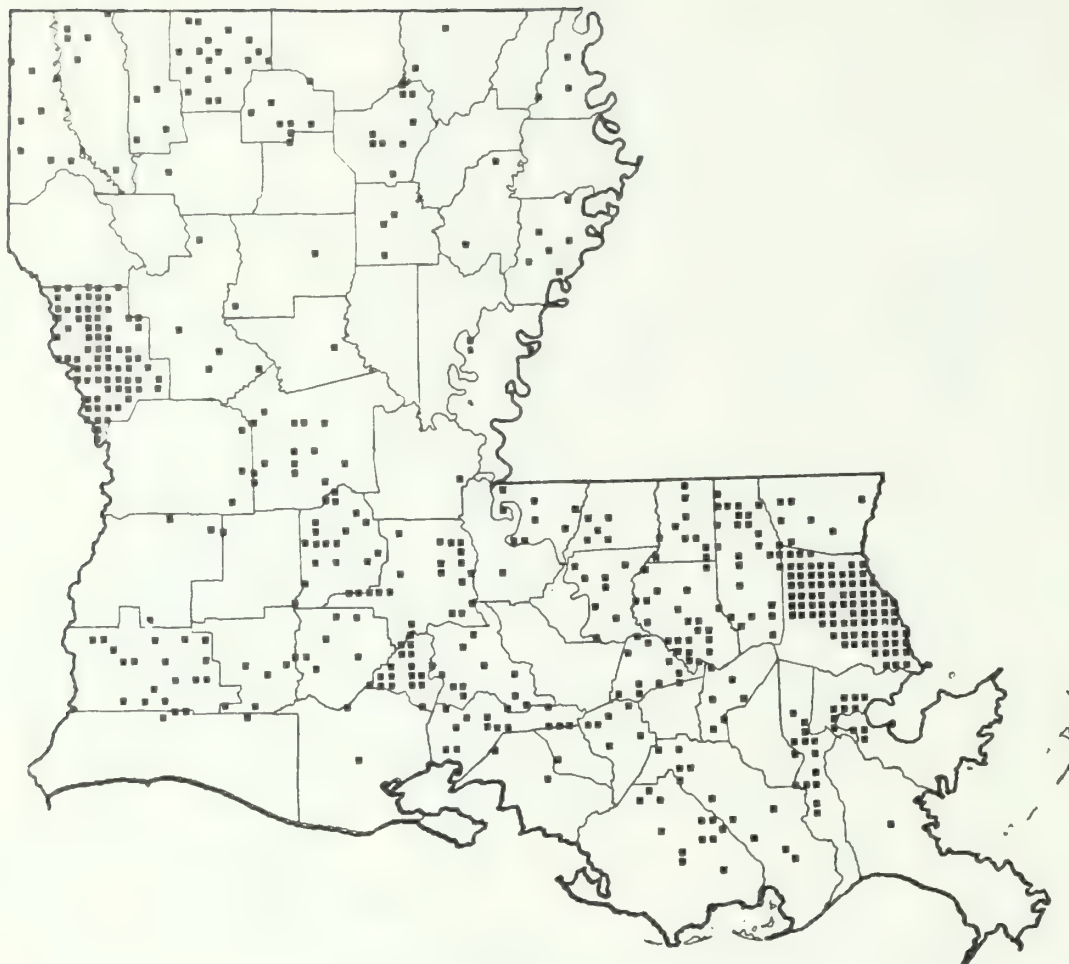


Figure 13.—Number of trailer sites, Louisiana, 1984 (DCRT). Each dot represents 18 trailer sites.

Table 14. —Area of pine timberland by stand-size class and detailed forest type, 1984, and change since 1974, Louisiana¹

Stand-size class	Loblolly-shortleaf ²				Longleaf-slash			
	Loblolly		Shortleaf		Slash		Longleaf	
	1984	Change	1984	Change	1984	Change	1984	Change
<i>Thousand acres</i>								
Sawtimber	2,246.0	+210	221.5	-55	259.8	+131	191.9	-39
Poletimber	604.8	-208	58.9	-77	218.9	-120	62.8	+22
Sapling-seedling	835.3	+133	23.7	-34	135.6	-8	52.3	-49
Nonstocked	13.1	-15	0.0	-6	5.7	+6	6.3	-35
All classes	3,699.2	+120	304.2	-172	619.9	+10	313.2	-100

¹Change information calculated from 1974 data revised to current standards. Columns may not sum to totals due to rounding.

²Other detailed loblolly-shortleaf type: spruce pine, 29,800 acres in 1984, up 16,500 acres from 1974; all in sawtimber size class.

Table 15. —Area of hardwood timberland by stand-size class and forest type, 1984, and change since 1974, Louisiana¹

Stand-size class	Oak-pine		Oak-hickory		Oak-gum-cypress		Elm-ash-cottonwood	
	1984	Change	1984	Change	1984	Change	1984	Change
	<i>Thousand acres</i>							
Sawtimber	1,044.8	+6	799.8	+129	3,157.9	-55	227.2	-40
Poletimber	383.9	-104	584.1	+199	702.2	-372	103.3	-29
Sapling-seedling	473.5	-199	698.6	+87	258.0	-255	48.8	-59
Nonstocked	11.0	+5	88.2	+31	259.5	+105	32.9	+0
All classes	1,913.3	-292	2,170.7	+446	4,377.6	-578	412.4	-128

¹Change information calculated from 1974 data revised to current standards. Columns may not sum to totals due to rounding.

timber value changes will affect nontimber values is a matter for further study.

Cordell and Hendee (1982) state that U.S. demographic trends suggest more crowding and increased regulation of remaining timberland, reduced public sector involvement in providing other forest values, and a decline in wildlife and recreational opportunities in remote areas. The Conservation Reserve Program authorized under the Food Security Act of 1985 is aimed at retiring cropland with high erosion potential, and is expected to increase selected nontimber values (notably soil productivity, water quality, and wildlife habitat) in erosion problem areas (fig. 4). The program is aimed also at increasing the supply of forest resources where the land is planted with trees.

In the future, some reduction in timberland due to urban and agricultural development, an increase in road construction on remaining timberland, and a reduction in remote timberland areas can be expected to continue with increases in the State's population and increases in the demand for wood products. Timberland in public ownership is likely to increase in value for water, soils, range, wildlife, and recreation, if these become scarce on private land.

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Appendix

Survey Methods

Forest resource statistics were obtained by a sampling method employing a forest-nonforest classification on aerial photography and on-the-ground measurements of trees at sample locations. The estimate of timberland acreage is based on the photointerpretation of recent aerial photography using dot counts as to forest or nonforest condition. These dot counts yield the proportion of forest to nonforest areas in each parish. Forest area changes are then determined from field observations of permanent 3-mile grid of permanent plots. Additional plots (intensification plots) for classifying points as to forest or nonforest condition only are used to further reduce the sampling error for forest area. The field classifications of these two types of plots (3-mile grid and intensification) are used to correct photointerpretation errors and adjust the parish timberland acreage estimate from the dot counts. The intensity level of the 3-mile grid layout of permanent plots averages 5,760 acres per plot.

Volume estimates come entirely from individual tree measurements on forested plots. In Louisiana, five horizontal points were measured at each forested location. Trees 5.0 inches in diameter and larger were selected with a 37.5 factor prism; thus each tree selected with the prism represented 7.5 square feet of basal area. Trees smaller than 5.0 inches in diameter were tallied on a 1/275-acre fixed circular plot around the first 3 points of the 5-point cluster.

Volumes in Louisiana were derived from fixed form diameter-squared times bole length regression equations. These equations were developed from deterministic measurements of trees on 8 percent of the field locations. The deterministic measurements included diameter at breast height, total height, bole length, log length, and four upper stem diameters. Volumes for these trees were computed using Smalian's formula. Equations were developed for seven species groups in Louisiana; these equations were used to estimate volume of the remaining trees that were not measured deterministically.

Reliability of the Data

A relative standard of accuracy has been incorporated into the forest survey. This minimizes human and instrumentation error and permits the control of costs within prescribed economic limits.

The first type of error, estimating error, can be caused

by improperly calibrated instruments, by instruments with limited precision, by human error in measuring and compiling. All of these are minimized by a system that incorporates training, check plots, and an edit (consistency) check of the data received. Estimating error is not assessed statistically but the Forest Inventory and Analysis Unit holds it to a minimum by adequate training, experienced supervision, and emphasis on careful work.

The second type of error, sampling error, is associated with natural and expected deviation of individual measurements from the average of the whole sample. Thus, the deviation is susceptible to a mathematical evaluation of the probability of error. Sampling errors are based on one standard deviation. That is, the chances are 2 out of 3 that if the results of a 100 percent census were known the sample results would be within certain limits.

Estimates smaller than State totals have larger sampling errors. The smaller the area examined, the larger the sampling error. In addition, as area or volume totals are stratified by forest type, species, diameter class, ownership, or other subdivisions, the sampling error increases and is greatest for the smallest subdivisions. The sampling error for State totals and smaller estimates are depicted in table A1.

Table A1.—Sampling error to which estimates are liable, two chances out of three, Louisiana, 1984

Sampling error	Timberland area	Growing-stock volume
Percent	Thousand acres	Million cubic feet
0.3	13,872.6	...
1.0	1,248.5	...
2.0	312.1	17,140.3
3.0	138.7	7,617.9
4.0	78.0	4,285.1
5.0	49.9	2,742.4
10.0	12.5	685.6
15.0	5.6	304.7
20.0	3.1	171.4
25.0	2.0	109.7

DEFINITION OF TERMS

Forest Land Classes

Forest Land—Land at least 16.7 percent stocked by forest trees of any size, or formerly having such tree cover, and not currently developed for nonforest uses. Minimum area considered for classification is one acre.

Timberland—Forest land that is producing, or is capable of producing, crops of industrial wood and not withdrawn from timber utilization. Timberland is synonymous with "commercial forest land" in prior reports.

Productive-Reserved Forest Land—Productive public

forest land withdrawn from timber utilization through statute or administrative regulations.

Tree Classes

Commercial Species—Tree species currently or prospectively suitable for industrial wood products. Excluded are noncommercial species. See species list.

Noncommercial Species—Tree species of typical small size, poor form, or inferior quality that normally do not develop into trees suitable for industrial wood products. See species list.

Growing-Stock Trees—Live trees of commercial species classified as sawtimber, poletimber, sapling, and seedlings. Trees must have a 12-foot butt log (a merchantable 12-foot log in the first 16 feet of the bole) now or prospectively to be classed as growing stock.

Rough Trees—Live trees of commercial species that are unmerchantable for saw logs currently or potentially because of roughness or poor form in the butt log. Also included are all live trees of noncommercial species.

Rotten Trees—Live trees of commercial species that are unmerchantable for saw logs currently or potentially because of rot deduction in the butt log.

Cull Trees—Rough or rotten trees.

Hardwoods—Dicotyledonous trees, usually broad-leaved and deciduous.

Softwoods—Coniferous trees, usually evergreen, having needle or scalelike leaves.

Live Trees—Included are all size classes of growing-stock, rough, and rotten trees.

Salvable Dead Trees—Standing or down dead trees that were formerly growing stock and are considered merchantable.

Forest Types

Longleaf-Slash Pine—Forests in which longleaf or slash pine, singly or in combination, comprise a plurality of the stocking. Common associates include other southern pines, oak, and gum.

Loblolly-Shortleaf Pine—Forests in which loblolly, shortleaf, Virginia, sand, pond, spruce, pitch, and Table-Mountain pine or eastern redcedar singly or in combination, comprise a plurality of the stocking. Common associates include oak, hickory, and gum.

Oak-Pine—Forest in which hardwoods (usually upland oaks) comprise a plurality of the stocking, but in which softwoods, except cypress, comprise 25-49 percent of the stocking. Common associates include gum, hickory, and yellow-poplar.

Oak-Hickory—Forests in which upland oaks or hickory, singly or in combination, comprise a plurality of the stocking except where pines comprise 25-50 percent, in which case the stand would be classified oak-pine. Common associates include yellow-poplar, elm, maple, and black walnut.

Oak-Gum-Cypress—Bottomland forest in which tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination, comprise a plurality of the stocking except where pines comprise 25-50 percent, in which case the stand would be classified oak-pine. Common associates include cottonwood, willow, ash, elm, hackberry, and maple.

Elm-Ash-Cottonwood—Forest in which elm, ash, or cottonwood, singly or in combination, comprise a plurality of the stocking. Common associates include willow, sycamore, beech, and maple.

Nontyped—Timberland currently unoccupied with any live trees or seedlings, e.g. very recent clearcut areas.

Dimension Classes of Trees

Sawtimber Trees—Trees 9.0 inches and larger in d.b.h. for softwoods, and 11.0 inches and larger for hardwoods.

Poletimber Trees—Trees 5.0 to 8.9 inches in d.b.h. for softwoods and 5.0 to 10.9 inches d.b.h. for hardwoods.

Saplings—Trees 1.0 inch to 4.9 inches in d.b.h.

Seedlings—Trees less than 1.0 inch in d.b.h.

Stand-Size Classes

Sawtimber Stands—Stands at least 16.7 percent stocked with growing-stock trees, half or more of this stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber Stands—Stands at least 16.7 percent stocked with growing-stock trees, half or more of this stocking in sawtimber or poletimber trees, and with poletimber stocking exceeding that of sawtimber stocking.

Sapling-Seedling Stands—Stands at least 16.7 percent stocked with growing-stock trees, more than half of this stocking in saplings or seedlings.

Nonstocked Stands—Stands less than 16.7 percent stocked with growing-stock trees.

Stocking

Stocking is a measure of the extent to which the growth potential of the site is utilized by trees or

preempted by vegetative cover. Stocking is determined by comparing the stand density in terms of number of trees or basal area with a specified standard. Full stocking is considered 100 percent of the stocking standard.

The tabulation by size class shows the density standard in terms of trees required per acre, for full stocking.

Volume

Volume of Cull—The volume of sound wood in the bole of rough and rotten trees.

Volume of Growing Stock—Volume of sound wood in the bole of sawtimber and poletimber trees from a 1-foot stump to a minimum 4.0-inch top outside bark or to the point where the central stem breaks into limbs. Rough, rotten, and noncommercial trees are excluded.

Volume of Saw-log—Net volume of the saw-log portion (between a 1 foot stump and 7.0 inches diameter outside bark for softwoods and 9.0 inches dob for hardwoods) of growing-stock sawtimber trees in cubic feet. Net volume equals gross volume less deductions for rot, sweep, and other defects that affect use for lumber to the point where the central stem breaks into limbs. Rough, rotten, and noncommercial trees are excluded.

Volume of Timber—The volume of sound wood in the bole of growing stock, rough, rotten, and salvable dead trees 5.0 inches and larger in d.b.h. from a 1-foot stump to a minimum 4.0-inch top outside bark, or to the point where the central stem breaks into limbs.

Ownership Classes

Public Land—National Forest Land, other federal land, state, county, and municipal land.

National Forest Land—Federal lands that have been legally designated as National Forests or purchase units, and other lands under the administration of the Forest Service, including experimental areas.

Other Federal Land—Federal lands other than National Forests; lands administered by the Bureau of Land Management and Indian Lands.

State, County, and Municipal Land—Lands owned by States, county-equivalent Louisiana parishes, and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

Forest Industry Land—Lands owned by companies or individuals operating wood-using plants (either primary or secondary).

Other Private Land—Lands privately owned by individuals or corporations, other than the forest industry.

Miscellaneous Definitions

Basal Area—The area in square feet of the cross section at breast height of a single tree or of all the trees in a stand, usually expressed in square feet per acre.

D.b.h. (diameter at breast height)—Tree diameter in

D.b.h. (inches)	Number of trees	D.b.h. (inches)	Number of trees
Seedlings	600	16	72
2	560	18	60
4	460	20	51
6	340	22	42
8	240	24	36
10	155	26	31
12	115	28	27
14	90	30	24

inches, outside bark, measured at 4½ feet above ground.

Diameter Classes—The 2-inch diameter classes extend from 1.0 inch below to 0.9 inches above the stated midpoint. Thus, the 12-inch class included trees 11.0 inches through 12.9 inches d.b.h.

Mortality—Number or sound-wood volume of live trees dying from natural causes during a specified period.

Plantations—Stands evidenced by regeneration from planting or seeding. Forest Survey categorizes plantations by forest type based upon plot tally.

LIST OF SPECIES

Table A2 ranks all live trees (1.0 inches d.b.h. and larger) by relative importance and presents data on occurrence, relative importance, frequency, density, and basal area. The timber report (Rosson and others 1988) ranks species by survey unit and volume for all live trees and provides maps of the relative volume distribution of selected species.

Scientific and common names of tree species that were recorded on plots sampled in Louisiana:¹

Genus and species Common Name

Softwoods

<i>Juniperus silicicola</i>	southern redcedar
<i>J. virginiana</i>	easter redcedar
<i>Pinus echinata</i>	shortleaf pine
<i>P. elliotii</i>	slash pine
<i>P. glabra</i>	spruce pine
<i>P. palustris</i>	longleaf pine
<i>P. serotina</i>	pond pine
<i>P. taeda</i>	loblolly pine
<i>Taxodium distichum</i>	
var. <i>distichum</i>	baldcypress
<i>T. distichum</i> var. <i>nutans</i>	pondcypress

Hardwoods

<i>Acer barbatum</i>	Florida maple
<i>A. negundo</i>	boxelder
<i>A. rubrum</i> var. <i>rubrum</i>	red maple
<i>A. saccharinum</i>	silver maple
<i>A. saccharum</i>	sugar maple
<i>Aesculus</i> sp. ²	buckeye
<i>Betula nigra</i>	river birch
<i>Bumelia</i> sp. ²	bumelia
<i>Carpinus caroliniana</i> ²	bluebeech
<i>Carya</i> sp. ²	hickory
<i>C. aquatica</i>	water hickory
<i>C. illinoensis</i>	pecan
<i>Castanea</i> sp. ²	chinkapin
<i>Castanea dentata</i>	American chestnut
<i>Celtis laevigata</i>	sugarberry
<i>C. occidentalis</i>	hackberry
<i>Cercis canadensis</i> ²	eastern redbud
<i>Cornus florida</i>	flowering dogwood

<i>Crataegus</i> sp. ²	hawthorn
<i>Diospyros virginiana</i>	common persimmon
<i>Fagus grandifolia</i>	American beech
<i>Fraxinus americana</i>	white ash
<i>F. pennsylvanica</i>	green ash
<i>F. profunda</i>	pumpkin ash
<i>Gleditsia aquatica</i>	water locust
<i>G. triacanthos</i>	honey locust
<i>Ilex opaca</i>	American holly
<i>Juglans nigra</i>	black walnut
<i>Liquidambar styraciflua</i>	sweetgum
<i>Liriodendron tulipifera</i>	yellow-poplar
<i>Maclura pomifera</i>	Osage-orange
<i>Magnolia acuminata</i>	cucumbertree
<i>M. grandiflora</i>	southern magnolia
<i>M. macrophylla</i> ²	bigleaf magnolia
<i>M. virginiana</i>	sweetbay
<i>Malus</i> sp. ²	apple
<i>Melia azedarach</i> ²	chinaberry
<i>Morus rubra</i>	red mulberry
<i>Nyssa aquatica</i>	water tupelo
<i>N. sylvatica</i> var. <i>sylvatica</i>	blackgum
<i>N. sylvatica</i> var. <i>biflora</i>	swamp tupelo
<i>Ostrya virginiana</i> ²	ironwood
<i>Oxydendrum arboreum</i> ²	sourwood
<i>Persea borbonia</i>	redbay
<i>Planera aquatica</i> ²	water-elm
<i>Platanus occidentalis</i>	American sycamore
<i>Populus</i> sp.	cottonwood
<i>Prunus</i> sp. ²	cherries, plums
<i>P. serotina</i>	black cherry
<i>Quercus alba</i>	white oak
<i>Q. bicolor</i>	swamp white oak
<i>Q. falcata</i> var. <i>falcata</i>	southern red oak
<i>Q. falcata</i> var. <i>pagodifolia</i>	cherrybark oak
<i>Q. incana</i> ²	bluejack oak
<i>Q. laurifolia</i>	laurel oak
<i>Q. lyrata</i>	overcup oak
<i>Q. marilandica</i> ²	blackjack oak
<i>Q. michauxii</i>	swamp chestnut oak
<i>Q. muehlenbergii</i>	chinkapin oak
<i>Q. nigra</i>	water oak
<i>Q. nuttallii</i>	Nuttall oak
<i>Q. palustris</i>	pin oak
<i>Q. phellos</i>	willow oak
<i>Q. prinus</i>	chestnut oak
<i>Q. shumardii</i>	Shumard oak
<i>Q. stellata</i> var. <i>stellata</i>	post oak
<i>Q. stellata</i> var. <i>paludosa</i>	Delta post oak
<i>Q. velutina</i>	black oak
<i>Q. virginiana</i> ²	live oak
<i>Robinia pseudoacacia</i>	black locust
<i>Salix</i> sp.	willow
<i>Sassafras albidum</i>	sassafras
<i>Tilia americana</i>	American basswood
<i>T. heterophylla</i>	white basswood
<i>Ulmus alata</i>	winged elm

<i>U. americana</i>	American elm
<i>U. crassifolia</i>	cedar elm
<i>U. rubra</i>	slippery elm
<i>Vaccinium arboreum</i> ²	sparkleberry

¹ Names according to: Little, Elbert L., Jr. Checklist of United States Trees (Native and Naturalized). 1978. U.S. Department of Agriculture, Agr. Handbook No. 541, 375 p.

² Noncommercial species.

Table A2.—*Occurrence and relative importance (frequency, density, and basal area) of all live trees 1.0 inches diameter at breast height or greater by species on timberland, Louisiana, 1984*

Species	Occurrence ¹	Relative ² importance	Relative ¹ frequency	Relative ¹ density	Relative ⁵ basal area
			Percent		
Loblolly pine	51.5	18.4	10.4	19.2	25.5
Sweetgum	50.6	11.0	10.2	13.2	9.5
Red maple	24.3	5.3	4.9	7.9	3.2
Water oak	24.4	4.1	4.9	3.4	3.8
Blackgum	23.5	3.8	4.7	4.2	2.4
Baldcypress and pondcypress	12.6	3.5	2.5	2.0	5.9
Shortleaf pine	17.5	3.4	3.5	2.6	4.1
Green ash	15.2	3.1	3.1	3.2	2.9
Southern red oak	18.7	2.8	3.8	2.2	2.3
Water tupelo	6.6	2.7	1.3	1.8	4.9
Bluebeech	11.9	2.5	2.4	3.8	1.3
Slash pine	6.4	2.3	1.3	2.2	3.3
Post oak	13.9	2.1	2.8	1.8	1.7
Winged elm	12.9	2.1	2.6	2.8	.7
White oak	13.5	2.0	2.7	1.6	1.7
Sugarberry and hackberry	9.8	2.0	2.0	1.8	2.1
Hickory (a)	13.6	1.9	2.7	1.7	1.4
Willow oak	10.3	1.7	2.1	1.2	1.9
Flowering dogwood	9.9	1.6	2.0	2.4	.6
Willow	5.7	1.4	1.2	1.0	2.1
Cherrybark oak	10.7	1.4	2.2	.9	1.3
Water hickory	7.5	1.4	1.5	1.2	1.5
Longleaf pine	6.9	1.3	1.4	.8	1.8
Ironwood	6.4	1.3	1.3	2.2	.4
Hawthorn	7.9	1.3	1.6	2.0	.3
American elm	8.2	1.2	1.7	1.0	1.1
Overcup oak	7.6	1.2	1.5	.5	1.5
Laurel oak	5.6	1.0	1.1	.9	1.0
American beech	6.1	.9	1.2	.3	1.1
Nuttall oak	4.8	.7	1.0	.2	.8
Common persimmon	4.6	.7	.9	.8	.2
Sweetbay	2.9	.6	.6	.7	.5
American holly	4.1	.6	.8	.7	.3
Boxelder	3.1	.6	.6	.6	.5
Black cherry	4.5	.6	.9	.5	.2
Swamp chestnut oak	3.6	.5	.7	.3	.5
White ash	3.6	.5	.7	.4	.3
Blackjack oak	2.6	.4	.5	.6	.3
Water-elm	2.0	.4	.4	.6	.3
Cottonwood	2.1	.4	.4	.1	.5
Sassafras	2.7	.4	.5	.4	.1
Swamp tupelo	0.9	.3	.2	.3	.5
American sycamore	2.2	.3	.4	.1	.4

Table A2.—*Occurrence and relative importance (frequency, density, and basal area) of all live trees 1.0 inches diameter at breast height or greater by species on timberland, Louisiana, 1984—Continued*

Cedar elm	1.9	.3	.4	.2	.3
Plum and cherry except black cherry	2.0	.3	.4	.4	.1
Sparkleberry	2.2	.3	.5	.4	.1
Slippery elm	2.0	.3	.4	.3	.2
Pecan	1.6	.3	.3	.2	.3
Honey locust	2.2	.3	.5	.1	.2
Spruce pine	1.4	.3	.3	.1	.4
Southern magnolia	1.9	.2	.4	.1	.2
Black oak	2.0	.2	.4	.2	.1
Yellow-poplar	1.6	.2	.3	.1	.2
Redbay	1.1	.2	.2	.3	.1
Sourwood	1.1	.2	.2	.2	.1
Red mulberry	1.3	.2	.3	.2	.1
Florida maple	.9	.1	.2	.2	(b)
Live oak	1.0	.1	.2	.1	.1
Eastern and southern redcedar	1.1	.1	.2	.1	(b)
Water locust	1.0	.1	.2	.1	.1
Shumard oak	.6	.1	.1	(b)	.1
Chinkapin	.4	.1	.1	.1	(b)
River birch	.4	.1	.1	(b)	(b)
Other species	(c)	.7	1.0	.5	.5
Total	495.9	100.0	100.0	100.0	100.0

Columns may not sum to totals due to rounding.

¹Percent of 2,365 timberland plots surveyed.

²Sum of relative frequency + relative density + relative basal area and divided by 3.

³Occurrence times 100.0 and divided by 495.9.

⁴Out of the estimated number of live trees, 8,077 million trees Statewide.

⁵Out of the estimated basal area, 1,250 million square feet Statewide.

(a) Except pecan and water hickory.

(b) Less than 0.05 percent.

(c) Relative importance is less than 0.05 percent for each species not listed above. Occurrence is less than 0.35 percent for each species not listed above. (see species list)

Rudis, Victor A. Nontimber values of Louisiana's timberland. Resour. Bull. SO-132. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 1988. 27 p.

Principal findings of the 1984 survey of Louisiana's timberland are presented and discussed in terms of nontimber values: water quality, soils, range, wildlife habitat, aesthetics, and dispersed recreation.

Additional keywords: multiresource inventory, dead trees, snags, hard mast, species list.



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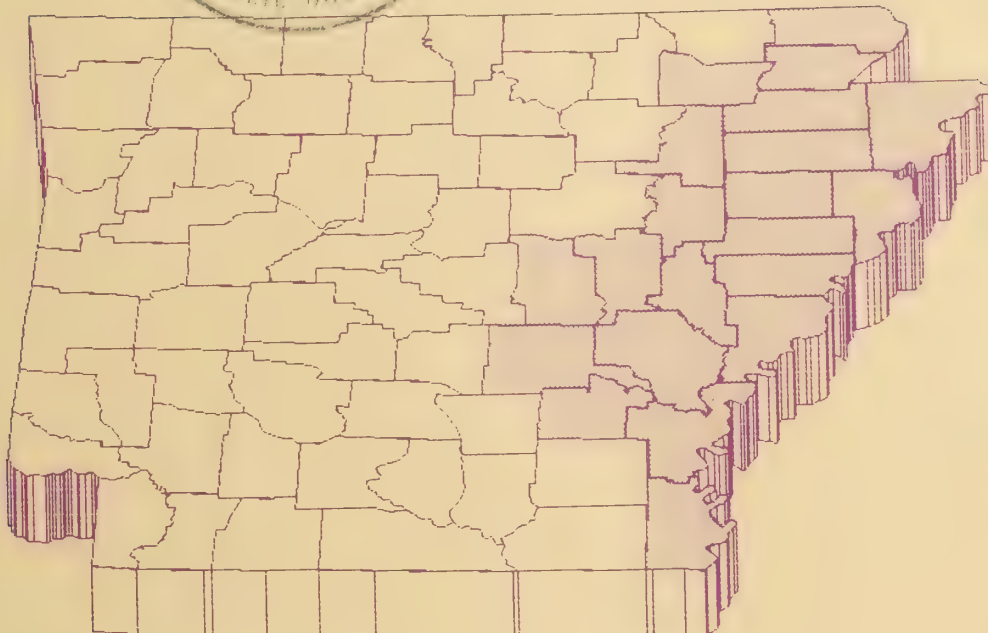
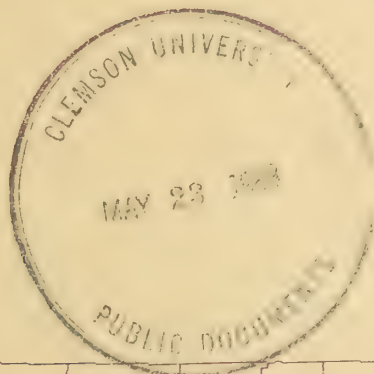
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Forest Statistics for Arkansas' Delta Counties - 1988

F. Dee Hines



SUMMARY

The 1988 survey of the Arkansas Delta showed the following changes since the 1978 survey:

- * Timberland area now covers 1,899.0 thousand acres, up 4 percent since 1978.
- * Forest industry-owned timberland decreased 11 percent, other privately owned timberland increased 7 percent.
- * Area covered by the loblolly-shortleaf forest type is up 26 percent.
- * Oak-pine forest types showed a 20-percent decrease in acreage.
- * Bottomland hardwood forest types increased by 38.0 thousand acres, 3 percent.
- * Sawtimber stands increased 9 percent, poletimber stands decreased 5 percent, sapling-seedling stands decreased 3 percent.
- * Plantations now cover 53.2 thousand acres, an increase of 116 percent.
- * Softwood volumes have increased, 23 percent for growing stock, 14 percent for sawtimber.
- * Hardwood volumes have increased, 26 percent for growing stock, 31 percent for sawtimber.
- * Softwood growth and removals, growing stock and sawtimber, have increased.
- * Hardwood growth on growing stock is down, growth on sawtimber is up.
- * Removals of hardwood, both growing stock and sawtimber, have decreased substantially.
- * Mortality estimates are up.

FOREWORD

The Southern Forest Survey, an activity of the Southern Forest Experiment Station Forest Inventory and Analysis work unit, covers the States of Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, Tennessee, and East Texas, and the island of Puerto Rico.

This survey is part of the nationwide Forest Survey originally authorized by the McSweeney-McNary Act of 1928. More recent legislation pertinent to the survey mission includes the Forest and Rangeland Renewable Resources Planning Act of 1974 and the Forest and Rangeland Renewable Resources Research Act of 1978. The survey mission is to develop, analyze, and maintain renewable forest resource information. This information is essential for formulation of forest policies and programs.

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*Core tables are presented in response to the Southern Industrial Forestry Research Council's recommendations. These tables are identical among Forest Inventory and Analysis units in the eastern United States.



Figure I.—The forest survey regions of Arkansas

Forest Statistics for Arkansas' Delta Counties—1988

F. Dee Hines

INTRODUCTION

Tabulated results were derived from data obtained during a recent inventory of 21 counties comprising the Arkansas Delta (fig. 1). Data on forest acreage and timber volume were secured by a three-step process. A forest-nonforest classification using aerial photographs was accomplished for points representing approximately 230 acres. These photo classifications were adjusted based on ground observations at sample locations representing approximately 3,840 acres. Finally, field measurements were made at forest locations on the intersections of grid lines spaced 3 miles apart. At these forest locations, per-acre estimates were obtained from trees measured on ten 37.5 basal area factor prism points.

The sampling methods were designed to achieve suitable sampling errors for estimates of area and volume at the State level. Sampling error increases as the area or volume considered decreases. The sampling errors presented in table I, equal to one standard deviation for the sample data, may be used to construct confidence intervals for population parameters. For example, at the 95 percent confidence level, the confidence interval for growing-stock volume (in million cubic feet) in the Arkansas Delta (with a sampling error of 6.2 percent) is

$$\begin{aligned} 2,534.9 \pm 1.96(0.062 \times 2,534.9) = \\ 2,534.9 \pm 308.0 \end{aligned}$$

where 1.96 is the number of standard deviations. This confidence interval indicates that the actual growing-stock volume lies in the range 2,226.9 to 2,842.9 million cubic feet, unless a 1 in 20 chance has occurred.

Sampling errors for sub-groups of counties in the unit may be estimated by the following formula:

$$SE_g = \frac{SE_t \sqrt{X_t}}{\sqrt{X_g}}$$

where:

- SE = standard error of estimate
(expressed as a percent)
- X = variable of interest
(area or volume)
- g = group of counties to be combined
- t = total for the unit.

For example, the sampling error estimate of growing-stock volume for Chicot, Desha, and Lincoln counties is 13.6 percent. Thus, the 95 percent confidence interval for growing-stock volume is 527.2 ± 140.5 million cubic feet.

Ownership information is obtained by the same systematic sample outlined above. County courthouse records are used to obtain ownership information for each forested plot. An expansion factor representing timberland area in that county is then applied to the ownership group the plot represents. Next, the ownership groups are totaled for each county. Thus, acreages reported at the county level are estimates and may not exactly match known totals for each ownership category within that county.

In order to achieve greater compatibility among Forest Inventory and Analysis Projects, a new tree grading classification has been initiated for the 1988 Arkansas Survey. Tree grade 5 is used for trees currently or prospectively capable of producing at least

Table I—Sampling errors¹ for timberland, growing stock, and sawtimber, Arkansas Delta, 1988

County	Timberland	Growing stock			Sawtimber volume
		Volume	Growth	Removals	
----- <i>Percent</i> -----					
Arkansas	1.3	23.3	14.5	25.7	22.3
Chicot	1.8	23.3	39.8	22.9	25.6
Clay	1.5	29.5	24.5	...	32.5
Craighead	0.7	21.9	28.5	...	22.5
Crittenden ³	0.8	23.2	20.9	33.3	30.6
Cross ⁴	0.7	26.2	48.0	40.0	30.5
Desha	2.1	15.9	17.6	30.1	17.9
Greene	1.7	18.7	15.5	29.5	21.1
Jefferson	1.7	13.7	13.3	19.7	17.0
Lawrence	1.9	49.9	31.5	41.0	(2)
Lee	1.6	15.8	27.1	22.5	19.6
Lincoln	2.0	19.7	23.0	20.4	20.3
Lonoke	1.7	25.1	34.6	...	21.1
Monroe	1.7	15.8	24.3	16.5	18.5
Phillips	1.4	23.3	45.6	34.1	27.4
Poinsett	1.3	21.0	23.4	...	22.8
Prairie	0.9	38.5	39.3	...	30.2
St. Francis	0.9	27.8	33.4	42.9	35.9
Woodruff	1.3	19.2	21.6	23.6	23.1
All counties	0.3	6.2	6.0	8.1	6.5

¹ By random-sampling formula.

² Sampling error greater than 50.

³ Mississippi included in Crittenden.

⁴ Jackson included in Cross.

one 12-foot log or two 8-foot logs in the saw-log portion but not able to produce a 12-foot log in the butt 16 feet. These trees, formerly classed as rough or rotten, are now included in growing stock. Table II shows the impact of this change on volume and growth.

For comparative purposes 1978 survey data were reprocessed using current procedures. Therefore, differences between 1978 and 1988 data should reflect resource changes and not data processing differences. Results from the reprocessed 1978 data are used for comparison to 1988 data in the Highlights that follow.

HIGHLIGHTS

Timberland Area

The area of timberland in the Arkansas Delta has stabilized since the last survey in

1978. Area of timberland increased 4 percent from 1,828.8 thousand acres to 1,899.0 thousand acres. This is a marked turnaround from the loss of timberland recorded in previous surveys. The Arkansas Delta is now 20 percent forested.

Forest land owned by forest industry, including land under long-term lease, decreased by 11 percent and is now 240.8 thousand acres. Other privately-owned timberland showed a 7-percent increase. This category, with 1,367.9 thousand acres, is still by far the greatest ownership group. Other ownership groups showed little change since the 1978 survey.

Changes in several forest types have occurred since the previous survey. The loblolly-shortleaf forest type has increased 26 percent to 86.3 thousand acres. An increase of 8 percent in the oak-hickory forest type has

Table II—Changes in volume and growth estimates due to inclusion of tree grade 5 in growing-stock inventory, Arkansas Delta, 1988

	Tree grade 5		
	Excluded from growing stock	Included in growing stock	Percent change
----- Million cubic feet -----			
Softwood:			
Growing-stock volume	265.1	290.3	9.5
Rough and rotten volume	38.3	13.1	-65.8
Growing-stock growth	9.8	12.4	26.5
Hardwood:			
Growing-stock volume	2089.6	2244.6	7.4
Rough and rotten volume	419.2	264.2	-37.0
Growing-stock growth	56.5	74.2	31.3
----- Million board feet -----			
Softwood:			
Sawtimber volume	1099.8	1218.4	10.8
Sawtimber growth	35.7	48.5	35.9
Hardwood:			
Sawtimber volume	7826.4	8482.1	8.4
Sawtimber growth	257.3	332.8	29.3

pushed the acreage total to 472.1 thousand acres. Bottomland hardwood types, oak-gum-cypress and elm-ash-cottonwood, have increased 2 percent and 18 percent respectively. Oak-gum-cypress, covering 1,165.5 thousand acres, remains the dominant forest type in the Arkansas Delta. Only the oak-pine forest type decreased in area, down 20 percent to 45.3 thousand acres.

Forests of the Arkansas Delta are maturing. This process is seen by a shift toward stands of larger size timber. Sawtimber stands increased by 9 percent and are now up to 1,181.1 thousand acres. Thus, sawtimber stands represent 62 percent of the total forest area. Accordingly, as the area in sawtimber stands has increased, the area in pole-timber and sapling-seedling stands is down 5 percent and 3 percent respectively. Poletimber stands now cover 442.2 thousand acres. The area covered by sapling-seedling stands is only 237.8 thousand acres despite a 28.6 thousand acre increase in plantation acreage. Plantations now cover 53.2 thousand acres.

Number of Trees

The total number of live trees has changed very little, down only .8 percent since the previous survey. However, the total number of live softwood trees is down 12 percent. There was virtually no change in the number of live hardwood trees. Most of the decline in softwood live trees occurred in the 2-inch diameter class, which suffered a 49-percent decrease. A pattern of change across diameters in the number of live hardwood trees is not evident.

Growing-stock trees, on the other hand, showed a 36-percent decline in total numbers. This loss is composed of a 16-percent decrease in softwoods and a 37-percent decrease in hardwoods. As with softwood live trees, the decline in softwood growing-stock trees was concentrated in the 2-inch class. The decrease in hardwood growing-stock trees is entirely within and below the 6-inch diameter class.

Timber Volume

Volumes of softwoods in the Arkansas Delta have increased since the previous survey. Between the 1969 and 1978 surveys softwood growing-stock volume increased 28.6 million cubic feet to 235.8 million cubic feet. The 10 years since the survey of 1978 witnessed another 23-percent increase with a current growing-stock volume of 290.3 million cubic feet. Similar increases are found for softwood sawtimber volumes. The 1969 survey showed 928.9 million board feet. The 1978 survey indicated a gain of 15 percent up to 1,064.5 million board feet. Current softwood sawtimber volume is at 1,218.4 million board feet, up another 14 percent.

Hardwood volumes are also up since the 1978 survey. But, the period between 1969 and 1978 showed a decline for both growing-stock and sawtimber volumes. Growing-stock volume went from 1,808.6 to 1,783.3 million cubic feet, while sawtimber volume moved from 6,477.5 to 6,467.2 million board feet. However, the current survey shows a 26-percent increase in growing-stock volume to 2,244.6 million cubic feet. Current sawtimber volume is up to 8,482.1 million board feet, a 31-percent increase.

Growth, Removals, and Mortality

Total average net annual growth of growing stock increased only .7 percent. This includes a 27-percent increase in softwood net annual growth and a 3-percent decrease in hardwood net annual growth. The current survey shows net annual growth of growing stock at 12.4 and 74.2 million cubic feet for softwoods and hardwoods respectively. It should be noted that without the reclassification of tree grade 5 trees mentioned above, total average net annual growth of growing stock would be down 23 percent (table II).

Contrary to growing-stock growth, total average net annual growth of sawtimber is up 32 percent. Softwood sawtimber growth is up 36 percent to 48.5 million board feet. Similarly, hardwood growth of sawtimber jumped

to 332.8 million board feet, a 31-percent gain. However, as table II indicates, without the inclusion of tree grade 5 trees in growing stock, total net annual growth of sawtimber is up only 1 percent.

Softwood average annual removals have increased since the 1978 survey. Removals of softwood growing stock are up to 8.1 million cubic feet from 7.2 million cubic feet. Sawtimber removals have increased 36 percent, now estimated at 37.4 million board feet.

Conversely, hardwood removals are down substantially. Since the previous survey, average annual removals of hardwood decreased 42 percent for growing stock and 30 percent for sawtimber. Removal estimates for hardwoods are now 36.0 million cubic feet and 144.4 million board feet for growing stock and sawtimber respectively.

Mortality estimates for the Arkansas Delta have also increased. Total average annual mortality on growing stock is 31.5 million cubic feet, an increase of 15 percent. Sawtimber mortality, up 12 percent, is 98.5 million board feet annually.

Tables 1-25 were developed to provide compatibility among Forest Inventory and Analysis Projects. Tables 26-36 are supplementary tables and may change from unit to unit or State to State to address specific resource issues.

DEFINITION OF TERMS

Average net annual growth.—Average net annual volume increase for the inter-survey period.

Average annual mortality.—Average annual sound-wood volume of growing-stock trees dying from natural causes.

Average annual removals.—Average net annual volume of growing-stock trees removed from the inventory by harvesting, cultural operations (such as timber-stand improvement), land clearing, or changes in land use.

Commercial species.—Tree species which normally develop into trees suitable for industrial wood products.

Forest type.—A classification of forest land based upon the species forming a plurality of live-tree stocking.

Growing-stock trees.—Live trees of commercial species. Rough and rotten trees are excluded.

Growing-stock volume.—The cubic-foot volume of sound wood in growing-stock trees at least 5.0 inches in diameter at breast height, from a 1-foot stump to a minimum 4.0-inch top diameter outside bark of the central stem, or to the point where the central stem breaks into limbs.

Live trees.—Commercial and non-commercial tree species of sapling size or larger.

Natural stands.—Stands with no evidence of artificial regeneration. This includes those stands established by seed tree regeneration methods.

Noncommercial species.—Tree species of typically small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products.

Planted stands.—Stands with some evidence of planting or direct seeding.

Poletimber trees.—Growing-stock trees at least 5.0 inches in diameter at breast height, but smaller than sawtimber size.

Reserved timberland.—Productive public forest land withdrawn from timber utilization through statute or administrative regulations.

Rotten trees.—Live trees of commercial species that do not contain at least one 12-foot log or two 8-foot logs in the saw-log portion, now or prospectively, primarily because of rot.

Rough trees.—Live trees of commercial species that do not contain at least one 12-foot log or two 8-foot logs in the saw-log portion, now or prospectively, primarily because of roughness or poor form. Also included are all live trees of noncommercial species.

Saplings.—Growing-stock trees at least 1.0 inches but less than 5.0 inches in diameter at breast height.

Sawtimber trees.—Live trees that contain at least one 12-foot log, or two 8-foot logs in the saw-log portion, and meet regional specifications for freedom from defect. Softwoods must be at least 9.0 inches in diameter at breast height and hardwoods at least 11.0 inches in diameter at breast height.

Sawtimber volume.—Sound-wood volume of the saw-log portion of growing-stock sawtimber trees in board feet, International 1/4-inch rule and in cubic feet.

Seedlings.—Growing-stock trees less than 1.0 inch in diameter at breast height, and greater than twelve inches in height for hardwoods, greater than six inches in height for softwoods, and greater than one-half inch in diameter at ground level for longleaf pine.

Select white oaks.—A classification of several white oak species composed of: white, swamp chestnut, swamp white, chinkapin, Durand, and bur oaks.

Select red oaks.—A classification of several red oak species composed of: cherrybark, Shumard, and northern red oaks.

Site class.—A classification of forest land in terms of inherent capacity to grow crops of industrial wood.

Stand-size class.—A classification of forest land based on the diameter size class of growing-stock trees on the sampled area; that is, sawtimber, poletimber, or sapling and seedling.

Timberland.—Forest land that is producing, or is capable of producing, crops of industrial wood and not withdrawn from timber utilization. Timberland is synonymous with "commercial forest land" in prior reports.

Tree grade.—A classification of the volume of the saw-log portion of sawtimber trees based on: 1) the log grade of the butt log, or 2) ability to produce at least one 12-foot log or two 8-foot logs in the upper-section of the saw-log portion.

Woodland.—Forest land incapable of yielding crops of industrial wood because of adverse site conditions.

Table 1—Area by county and land class, Arkansas Delta, 1988

County	All land ¹	Forest land			Reserved timberland	Nonforest land
		Total	Timberland ²	Woodland ³		
----- Thousand acres -----						
Arkansas	661.4	190.7	190.7	...	...	470.6
Chicot	442.1	83.7	83.7	...	...	358.4
Clay	410.3	78.5	78.5	...	...	331.8
Craighead	456.8	49.0	49.0	...	...	407.8
Crittenden ⁴	999.5	49.0	49.0	...	...	950.5
Cross ⁵	809.2	112.4	112.4	...	...	696.8
Desha	522.0	150.8	150.8	...	...	371.2
Greene	370.8	55.7	55.7	...	...	315.1
Jackson	...	...	...	...	...	...
Jefferson	586.4	218.8	218.8	...	...	367.6
Lawrence	378.4	84.6	84.6	...	...	293.8
Lee	399.3	98.4	98.4	...	...	300.9
Lincoln	364.8	153.2	153.2	...	...	211.6
Lonoke	514.2	75.8	75.8	...	...	438.4
Mississippi	...	...	...	...	...	...
Monroe	397.5	140.4	140.4	...	...	257.1
Phillips	465.6	94.4	94.4	...	...	371.2
Poinsett	489.5	54.9	54.9	...	...	434.6
Prairie	432.5	77.6	77.6	...	...	354.9
St. Francis	411.0	67.1	67.1	...	...	343.9
Woodruff	380.1	63.9	63.9	...	...	316.2
All counties	9491.3	1899.0	1899.0	...	...	7592.3

¹ From U.S. Bureau of the Census.

² Forest land (formerly termed commercial forest land) that is producing or capable of producing at least 20 cubic feet of industrial wood per acre per year. Includes areas which may be inaccessible or inoperable by current standards. Excludes reserved timberlands.

³ Forest land incapable of producing 20 cubic feet of industrial wood per acre per year under natural conditions because of adverse site conditions.

⁴ Mississippi included in Crittenden.

⁵ Jackson included in Cross.

Table 2—Area of timberland by county and ownership class, Arkansas Delta, 1988

County	All ownerships	National forest	Misc. federal	State	County and municipal	Forest industry ¹	Farmer	Corporate ²	Individual ²
----- Thousand acres -----									
Arkansas	190.7	...	46.2	28.9	...	5.8	52.0	17.3	40.5
Chicot	83.7	...	...	...	...	11.2	39.1	22.3	11.2
Clay	78.5	...	...	14.3	...	7.1	35.7	...	21.4
Craighead	49.0	...	...	14.7	...	...	4.9	9.8	19.6
Crittenden ³	49.0	...	4.9	9.8	4.9	...	24.5	4.9	...
Cross ⁴	112.4	...	...	...	...	...	46.8	9.4	56.2
Desha	150.8	...	14.4	...	...	64.6	14.4	43.1	14.4
Greene	55.7	...	...	...	...	...	11.1	...	44.6
Jefferson	218.8	...	16.0	10.7	...	48.0	16.0	26.7	101.4
Lawrence	84.6	...	...	6.0	...	...	30.2	...	48.4
Lee	98.4	16.4	...	...	...	8.2	24.6	...	49.2
Lincoln	153.2	...	...	6.7	...	33.3	20.0	26.6	66.6
Monroe	75.8	...	...	5.1	...	...	50.6	10.1	10.1
Monroe	140.4	...	20.1	5.0	...	50.1	40.1	5.0	20.1
Phillips	94.4	7.3	7.3	...	...	7.3	14.5	...	58.1
Poinsett	54.9	...	...	13.7	...	...	18.3	...	22.9
Rainier	77.6	...	5.2	20.7	...	5.2	25.9	10.4	10.4
St. Francis	67.1	...	...	12.2	...	...	36.6	6.1	12.2
Woodruff	63.9	...	...	...	...	...	49.2	...	14.8
All counties	1899.0	23.7	114.0	147.7	4.9	240.8	554.5	191.7	621.7

¹ Includes land leased to forest industry.

² Indian land will be classed as corporate or individual as defined by the Bureau of Indian Affairs.

³ Mississippi included in Crittenden.

⁴ Jackson included in Cross.

Table 3—Area of timberland by county and forest type group, Arkansas Delta, 1988

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum cypress	Elm-ash- cottonwood
		Planted	Natural				
----- <i>Thousand acres</i> -----							
Arkansas	190.7	...	...	...	40.5	138.7	11.6
Chicot	83.7	...	...	...	...	55.8	27.9
Clay	78.5	...	...	...	21.4	57.1	...
Craighead	49.0	...	...	...	14.7	24.5	9.8
Crittenden ¹	49.0	...	...	...	...	29.4	19.6
Cross ²	112.4	...	...	...	56.2	56.2	...
Desha	150.8	...	...	...	...	129.3	21.5
Greene	55.7	...	...	5.6	44.6	5.6	...
Jefferson	218.8	10.7	37.4	21.3	53.4	90.7	5.3
Lawrence	84.6	...	...	...	54.4	30.2	...
Lee	98.4	...	...	...	16.4	73.8	8.2
Lincoln	153.2	13.3	20.0	13.3	59.9	40.0	6.7
Lonoke	75.8	5.1	...	...	15.2	50.6	5.1
Monroe	140.4	...	...	5.0	20.1	110.3	5.0
Phillips	94.4	...	...	...	21.8	72.6	...
Poinsett	54.9	...	...	...	13.7	32.0	9.1
Prairie	77.6	...	...	...	15.5	62.1	...
St. Francis	67.1	...	...	...	24.4	42.7	...
Woodruff	63.9	...	...	...	...	63.9	...
All counties	1899.0	29.0	57.3	45.3	472.1	1165.5	129.8

¹ Mississippi included in Crittenden.

² Jackson included in Cross.

Table 4—Area of timberland by county and stand-size class, Arkansas Delta, 1988

County	All classes	Stand-size class		Sapling- seedling	Nonstocked ¹ areas
		Sawtimber	Poletimber		
-----Thousand acres-----					
Arkansas	190.7	167.6	11.6	5.8	5.8
Chicot	83.7	44.7	16.7	16.7	5.6
Clay	78.5	42.8	21.4	14.3	...
Craighead	49.0	34.3	4.9	9.8	...
Crittenden ²	49.0	19.6	19.6	4.9	4.9
Cross ³	112.4	37.5	65.5	9.4	...
Desha	150.8	122.1	28.7	...	...
Greene	55.7	39.0	16.7	...	...
Jefferson	218.8	106.7	64.0	48.0	...
Lawrence	84.6	36.3	24.2	24.2	...
Lee	98.4	82.0	8.2	8.2	...
Lincoln	153.2	86.6	46.6	20.0	...
Lonoke	75.8	35.4	15.2	25.3	...
Monroe	140.4	105.3	20.1	15.0	...
Phillips	94.4	65.4	14.5	14.5	...
Poinsett	54.9	41.1	4.6	4.6	4.6
Prairie	77.6	62.1	15.5	...	...
St. Francis	67.1	18.3	24.4	12.2	12.2
Woodruff	63.9	34.4	19.7	4.9	4.9
All counties	1899.0	1181.1	442.2	237.8	38.0

¹ Timberland less than 16.7 percent stocked.² Mississippi included in Crittenden.³ Jackson included in Cross.

**Table 5—Area of timberland by county and site class,
Arkansas Delta, 1988**

County	All classes	Site class (cubic feet/acre/year)				
		>165	120-165	85-120	50-85	<50
----- <i>Thousand acres</i> -----						
Arkansas	190.7	11.6	34.7	98.3	34.7	11.6
Chicot	83.7	5.6	22.3	16.7	22.3	16.7
Clay	78.5	28.5	7.1	21.4	14.3	7.1
Craighead	49.0	...	9.8	9.8	24.5	4.9
Crittenden ¹	49.0	14.7	4.9	4.9	19.6	4.9
Cross ²	112.4	...	18.7	18.7	37.5	37.5
Desha	150.8	35.9	28.7	64.6	21.5	...
Greene	55.7	...	5.6	5.6	33.4	11.1
Jefferson	218.8	10.7	16.0	112.1	74.7	5.3
Lawrence	84.6	...	12.1	6.0	48.4	18.1
Lee	98.4	...	49.2	24.6	16.4	8.2
Lincoln	153.2	6.7	33.3	59.9	53.3	...
Lonoke	75.8	15.2	5.1	20.2	30.3	5.1
Monroe	140.4	10.0	20.1	55.1	50.1	5.0
Phillips	94.4	14.5	21.8	21.8	36.3	...
Poinsett	54.9	...	13.7	27.4	9.1	4.6
Prairie	77.6	10.4	10.4	15.5	41.4	...
St. Francis	67.1	12.2	6.1	24.4	24.4	...
Woodruff	63.9	4.9	...	24.6	29.5	4.9
All counties	1899.0	180.8	319.5	631.8	621.8	145.1

¹ Mississippi included in Crittenden.

² Jackson included in Cross.

Table 6—Area of timberland by county and stocking classes of growing-stock trees, Arkansas Delta, 1988

County	All classes	Stocking class (percent)				
		>130	100-130	60-100	16.7-60	<16.7
----- <i>Thousand acres</i> -----						
Arkansas	190.7	...	23.1	115.6	46.2	5.8
Chicot	83.7	...	5.6	33.5	39.1	5.6
Clay	78.5	...	21.4	42.8	14.3	...
Craighead	49.0	...	4.9	19.6	24.5	...
Crittenden ¹	49.0	...	19.6	14.7	9.8	4.9
Cross ²	112.4	...	...	65.5	46.8	...
Desha	150.8	...	28.7	71.8	50.3	...
Greene	55.7	...	5.6	27.9	22.3	...
Jefferson	218.8	21.3	69.4	69.4	58.7	...
Lawrence	84.6	...	...	60.4	24.2	...
Lee	98.4	...	8.2	73.8	16.4	...
Lincoln	153.2	...	6.7	99.9	46.6	...
Lonoke	75.8	5.1	10.1	40.4	20.2	...
Monroe	140.4	5.0	15.0	70.2	50.1	...
Phillips	94.4	...	7.3	58.1	29.1	...
Poinsett	54.9	...	13.7	32.0	4.6	4.6
Prairie	77.6	...	10.4	51.8	15.5	...
St. Francis	67.1	...	6.1	36.6	12.2	12.2
Woodruff	63.9	...	14.8	29.5	14.8	4.9
All counties	1899.0	31.4	270.5	1013.6	545.6	38.0

¹ Mississippi included in Crittenden.

² Jackson included in Cross.

Table 7—Area of timberland by forest type and ownership class, Arkansas Delta, 1988

Forest type ¹	All ownerships	National forest	Other public	Forest industry	Forest industry- leased	Other private
	----- <i>Thousand acres</i> -----					
Loblolly-shortleaf pine	86.4	...	...	52.0	...	34.4
Softwood total	86.4	...	...	52.0	...	34.4
Oak-pine	45.3	...	5.3	17.3	...	22.6
Oak-hickory	472.1	23.7	33.2	6.7	...	408.6
Oak-gum-cypress	1165.5	...	218.6	149.5	...	797.4
Elm-ash-cottonwood	129.8	...	9.5	15.4	...	105.0
Hardwood total	1812.6	23.7	266.6	188.8	...	1333.5
All types	1899.0	23.7	266.6	240.8	...	1367.9

¹ Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

Table 8—Area of timberland by ownership and stocking classes of growing-stock trees, Arkansas Delta, 1988

Ownership class	All classes	Stocking class (percent)				
		>130	100-130	60-100	16.7-60	<16.7
		----- <i>Thousand acres</i> -----				
National forest	23.7	...	...	23.7	...	...
Other public	266.6	...	71.7	139.3	55.7	...
Forest industry	240.8	21.0	48.9	111.3	54.0	5.6
Other private	1367.9	10.4	149.9	739.3	435.9	32.4
All ownerships	1899.0	31.4	270.5	1013.6	545.6	38.0

Table 9—Area of timberland by forest type and stand-size class, Arkansas Delta, 1988

Forest type ¹	All classes	Stand-size class			Nonstocked ² areas
		Sawtimber	Poletimber	Sapling- seedling	
		----- <i>Thousand acres</i> -----			
Loblolly-shortleaf pine	86.4	41.3	34.7	10.4	...
Softwood total	86.4	41.3	34.7	10.4	...
Oak-pine	45.3	22.6	6.7	16.0	...
Oak-hickory	472.1	241.7	144.1	86.3	...
Oak-gum-cypress	1165.5	804.8	233.3	98.9	28.5
Elm-ash-cottonwood	129.8	70.8	23.4	26.1	9.5
Hardwood total	1812.6	1139.8	407.5	227.4	38.0
All types	1899.0	1181.1	442.2	237.8	38.0

¹ Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

² Timberland less than 16.7 percent stocked.

Table 10—Number of live trees on timberland by species and diameter class, Arkansas Delta, 1988

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
		----- <i>Thousand trees</i> -----											
Shortleaf-loblolly pine	45262	11437	15893	7927	4392	2210	1817	893	317	181	71	119	4
Cypress	4328	489	...	521	373	658	611	441	221	290	135	350	239
Other softwoods	4404	2768	1165	332	60	79	...	...	...	...	...	...	...
Total softwoods	53994	14694	17058	8780	4826	2947	2428	1334	538	471	206	469	24
Select white oaks	31158	17921	3497	3762	1409	1327	1199	716	600	243	237	226	20
Select red oaks	14587	6909	3190	932	599	437	602	425	291	372	267	525	37
Other white oaks	57603	24043	12123	6011	4587	3198	2227	1505	1293	901	572	947	195
Other red oaks	87196	42547	16371	7685	6004	4211	2821	2227	1886	1170	865	1135	274
Hickory	93139	56499	15478	6489	5527	3158	2458	1410	741	496	349	441	92
Hard maple	5996	4307	1504	...	124	61	...	...	...	...	...	...	...
Soft maple	55695	32124	14583	3867	2485	725	841	485	311	107	114	34	19
Beech	3370	1504	1504	...	...	...	81	...	48	74	39	121	...
Sweetgum	82003	50514	11998	7381	5056	2654	1704	1039	669	450	195	265	78
Tupelo-blackgum	37450	21730	7232	2254	1905	1581	882	377	332	290	173	475	220
Ash	76842	44651	18107	4560	3392	2255	1099	1087	627	427	220	368	49
Cottonwood-aspen	7771	2775	2246	325	190	393	350	347	333	249	181	316	66
Yellow-poplar	356	...	...	142	...	26	...	49	55	29	27	20	8
Black walnut	972	919	...	...	...	53	...	...	...	...	...	...	...
Other hardwoods	248821	157894	35957	18030	14941	7802	4382	3151	2355	1659	1188	1335	128
Total hardwoods	802958	464338	143788	61439	46219	27880	18646	12819	9540	6466	4427	6209	118
Noncommercial	87631	62769	16620	5768	1759	358	167	54	51	23	9	55	...
All species	944584	541802	177466	75986	52805	31185	21240	14206	10129	6960	4642	6733	1428

Table 11—Number of growing-stock trees on timberland by species and diameter class, Arkansas Delta, 1988

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
		-----Thousand trees-----											
Shortleaf-loblolly pine	40750	8315	14672	7791	4392	2210	1817	893	303	181	71	101	4
Cypress	3507	489	...	319	327	376	430	388	221	290	135	332	200
Other softwoods	3147	2768	...	239	60	79	...	...	...	...	...	...	...
Total softwoods	47404	11572	14672	8349	4779	2666	2247	1280	525	471	206	433	20
Select white oaks	19187	7775	2497	3454	1206	1258	1131	660	551	243	191	205	15
Select red oaks	9125	1999	3190	667	599	331	569	405	291	314	257	470	34
Other white oaks	33006	7421	7120	5166	3956	2961	1740	1228	1100	821	512	817	163
Other red oaks	52083	15753	10982	6251	5767	4047	2462	2061	1780	1016	801	1005	159
Hickory	45124	18656	7541	5821	4941	2689	2202	1338	657	460	314	425	79
Hard maple	3007	1318	1504	...	124	61	...	...	...	...	...	...	...
Soft maple	20475	6412	8188	2707	1520	514	479	230	222	85	88	21	8
Beech	1046	...	752	...	...	...	81	...	48	74	27	63	...
Sweetgum	49151	23099	8086	7046	4489	2374	1516	998	594	438	186	249	76
Tupelo-blackgum	17774	6287	4374	1896	1905	1470	497	290	234	190	96	371	163
Ash	31723	12997	6665	3809	3210	1884	772	918	521	395	202	321	29
Cottonwood-aspen	6754	1837	2246	325	190	393	350	330	313	249	164	295	62
Yellow-poplar	197	...	...	...	...	26	...	33	55	29	27	20	8
Black walnut	53	...	...	...	...	53	...	...	...	...	...	...	...
Other hardwoods	85568	25962	17589	13099	11443	6091	3328	2478	1934	1469	1006	1101	68
Total hardwoods	374272	129516	80733	50243	39351	24154	15129	10968	8301	5782	3870	5363	86
All species	421677	141088	95405	58592	44130	26820	17376	12248	8825	6253	4076	5796	1068

Table 12—Volume of growing stock on timberland by species and diameter class, Arkansas Delta, 1988

Species	All classes	Diameter class (inches at breast height)									
		5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Million cubic feet-----											
Shortleaf-loblolly pine	169.0	18.9	26.3	26.7	35.8	24.9	12.9	9.3	4.7	8.8	0.6
Cypress	120.0	0.7	1.4	3.6	7.2	8.6	6.7	13.6	8.8	24.9	44.5
Other softwoods	1.3	0.3	0.3	0.7	...	...	...	...	...	...	...
Total softwoods	290.3	19.9	28.0	31.0	43.1	33.5	19.6	23.0	13.5	33.7	45.0
Select white oaks	116.0	7.3	5.3	11.6	18.7	16.5	16.9	9.4	11.5	16.7	2.0
Select red oaks	98.8	1.7	3.8	3.3	9.5	9.0	8.9	12.4	13.5	32.5	4.1
Other white oaks	260.5	10.6	18.3	25.8	23.8	23.6	31.4	30.2	23.6	54.1	19.2
Other red oaks	410.6	14.7	33.2	42.4	38.8	47.6	54.2	41.1	41.3	76.9	20.4
Hickory	244.5	12.6	24.4	25.8	37.7	31.5	20.2	20.2	17.5	39.2	15.3
Hard maple	1.4	...	0.7	0.7	...	...	...	...	...	...	...
Soft maple	45.2	6.7	7.6	5.1	6.9	4.5	5.3	3.7	3.7	1.0	0.8
Beech	11.4	...	...	...	1.5	...	1.4	3.3	1.5	3.7	...
Sweetgum	214.3	15.6	23.8	27.1	27.7	26.5	22.5	21.1	11.7	22.2	16.1
Tupelo-blackgum	86.2	4.2	9.0	12.7	6.7	5.2	5.8	5.6	3.5	19.6	13.8
Ash	138.3	8.8	16.7	19.1	12.1	19.0	13.9	14.8	9.1	22.0	2.9
Cottonwood-aspen	96.7	1.1	1.3	5.1	6.7	8.8	11.4	12.3	11.2	28.4	10.4
Yellow-poplar	10.4	...	...	0.5	...	1.1	2.1	1.4	1.4	2.5	1.4
Black walnut	0.6	...	...	0.6	...	...	...	...	...	...	...
Other hardwoods	509.6	28.3	58.9	58.1	52.6	53.9	60.7	60.0	48.3	80.8	8.0
Total hardwoods	2244.6	111.6	203.1	237.9	242.6	247.4	254.8	235.4	197.8	399.6	114.5
All species	2534.9	131.4	231.1	268.8	285.7	280.8	274.4	258.4	211.3	433.3	159.6

Table 13—Volume of growing stock in the saw-log portion of sawtimber¹ trees on timberland by species and diameter class, Arkansas Delta, 1988

Species	All classes	Diameter class (inches at breast height)							
		9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million cubic feet -----									
Shortleaf-loblolly pine	103.0	20.7	30.2	21.4	11.5	8.1	3.8	6.9	0.5
Cypress	107.1	2.1	5.7	7.3	6.1	12.8	8.3	23.4	41.5
Other softwoods	0.6	0.6	...	...	...	...	...	...	...
Total softwoods	210.8	23.4	35.8	28.7	17.6	20.8	12.1	30.4	42.0
Select white oaks	76.4	...	14.0	14.0	14.4	7.9	9.9	14.3	1.8
Select red oaks	77.4	...	7.0	7.8	7.6	11.0	12.2	28.1	3.7
Other white oaks	173.8	...	18.0	19.5	26.2	26.0	19.9	46.5	17.8
Other red oaks	271.9	...	27.9	40.0	46.2	35.9	36.3	67.2	18.4
Hickory	151.2	...	28.1	26.2	17.2	17.0	15.2	33.9	13.6
Soft maple	20.9	...	4.9	3.6	4.3	3.3	3.4	0.8	0.8
Beech	9.2	...	1.0	...	1.2	2.4	1.2	3.4	...
Sweetgum	126.5	...	19.3	22.5	19.8	18.7	10.7	20.3	15.2
Tupelo-blackgum	51.6	...	3.9	4.2	4.8	4.9	3.2	17.6	13.1
Ash	78.7	...	8.7	14.2	12.1	12.9	8.2	20.0	2.7
Cottonwood-aspen	79.6	...	5.2	7.4	10.1	11.0	10.2	25.9	9.8
Yellow-poplar	9.1	...	...	1.0	1.9	1.2	1.3	2.3	1.4
Other hardwoods	309.7	...	38.3	44.6	51.3	53.0	42.4	73.0	7.1
Total hardwoods	1436.1	...	176.3	205.0	217.0	205.2	174.0	353.3	105.2
All species	1646.8	23.4	212.2	233.7	234.6	226.0	186.1	383.6	147.2

¹ That part of the bole of sawtimber trees between a 1-foot stump and saw-log top, including the portion of the forks large enough to contain a saw log.

Table 14—Volume of sawtimber on timberland by species and diameter class, Arkansas Delta, 1988

Species	All classes	Diameter class (inches at breast height)							
		9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Million board feet-----									
Shortleaf-loblolly pine	619.1	109.1	174.7	130.7	74.2	52.7	26.3	48.4	3.1
Cypress	596.1	9.4	28.2	36.2	31.0	72.9	49.1	130.5	238.8
Other softwoods	3.2	3.2	...	...	...	...	...	...	...
Total softwoods	1218.4	121.7	202.8	166.9	105.2	125.6	75.4	178.9	241.9
Select white oaks	460.4	...	76.7	81.9	85.6	48.7	60.5	95.1	11.9
Select red oaks	456.5	...	37.0	43.3	44.4	67.6	76.6	166.7	20.8
Other white oaks	1040.3	...	93.0	108.8	152.1	157.7	121.2	294.0	113.4
Other red oaks	1623.7	...	147.6	220.6	271.1	217.9	220.9	427.5	118.1
Hickory	936.0	...	156.7	153.0	104.1	104.7	96.3	230.6	90.8
Soft maple	117.4	...	26.7	20.4	22.9	19.8	20.4	4.8	2.4
Beech	58.8	...	5.7	...	7.3	15.1	7.9	22.8	...
Sweetgum	764.5	...	106.2	129.4	118.9	113.1	67.3	135.3	94.3
Tupelo-blackgum	229.1	...	19.0	20.6	23.1	25.4	15.1	77.1	48.6
Ash	431.9	...	45.5	74.1	67.3	73.1	44.9	112.8	14.2
Cottonwood-aspen	483.0	...	30.1	44.2	60.6	68.2	64.1	161.3	54.6
Yellow-poplar	57.3	...	...	6.2	12.0	7.6	7.6	15.2	8.7
Other hardwoods	1823.1	...	208.6	251.1	304.4	320.3	251.4	443.8	43.5
Total hardwoods	8482.1	...	952.9	1153.7	1274.0	1239.0	1054.2	2187.1	621.3
All species	9700.6	121.7	1155.7	1320.6	1379.2	1364.6	1129.6	2366.0	863.1

Table 15—Volume of growing stock and sawtimber on timberland by county and species group, Arkansas Delta, 1988

County	Growing stock						Sawtimber							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard ²
-----Million cubic feet-----						-----Million board feet-----								
Arkansas	296.8	...	...	13.9	88.8	194.1	1208.0	...	...	64.1	352.3	791.6		
Chicot	101.3	...	...	0.4	66.0	34.9	446.3	...	...	1.5	274.7	170.1		
Clay	119.2	...	...	0.4	35.9	82.8	466.2	...	...	1.4	133.8	331.0		
Craighead	54.8	...	0.4	9.0	24.5	21.0	191.1	...	...	36.9	87.2	67.0		
Crittenden ³	73.9	...	...	4.8	51.5	17.6	266.9	...	...	20.5	206.6	39.8		
Cross ⁴	99.0	...	...	...	15.9	83.1	309.3	...	...	...	40.8	268.5		
Desha	253.3	...	...	20.6	165.5	67.1	1034.0	...	...	104.7	627.8	301.4		
Greene	67.2	...	9.6	...	11.5	46.1	252.1	...	45.7	...	28.8	177.6		
Jefferson	285.1	6.2	82.3	15.6	57.4	123.6	950.6	...	277.9	69.0	209.2	394.6		
Lawrence	53.4	...	...	1.3	7.4	44.7	183.7	...	...	3.2	20.0	160.5		
Lee	166.1	...	...	3.1	86.2	76.8	734.8	...	...	15.7	390.7	328.4		
Lincoln	172.6	8.4	50.1	2.2	28.6	83.3	644.8	25.6	219.8	10.2	83.0	306.2		
Lonoke	73.0	3.5	...	2.2	19.1	48.3	257.3	17.7	...	10.8	54.8	174.0		
Monroe	227.4	...	8.0	25.2	77.2	116.9	885.2	...	30.5	148.7	242.9	463.2		
Phillips	114.8	...	...	0.7	40.6	73.4	457.2	...	...	3.9	164.7	288.6		
Poinsett	77.1	...	...	2.5	16.8	57.7	325.9	...	...	15.6	71.2	239.1		
Prairie	142.3	...	0.4	8.0	53.8	80.1	528.4	...	2.0	39.2	198.9	288.3		
St. Francis	59.0	...	...	0.5	20.1	48.4	249.0	...	...	2.2	58.6	188.1		
Woodruff	88.7	...	...	10.8	25.9	52.0	309.7	...	...	51.8	65.4	192.5		
All counties	2534.9	18.1	150.9	121.3	892.7	1351.9	9700.6	43.3	575.8	599.3	3311.5	5170.7		

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

³ Mississippi included in Crittenden.

⁴ Jackson included in Cross.

Table 16—Volume of timber on timberland by class of timber and species group, Arkansas Delta, 1988

Class of timber	All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²
		Planted	Natural			
----- Million cubic feet -----						
Sawtimber trees:						
Saw-log portion	1646.8	7.3	95.7	107.8	568.7	867.4
Upper-stem portion	287.6	2.2	18.6	10.8	93.4	162.7
Total	1934.5	9.5	114.3	118.6	662.1	1030.0
Poletimber trees	600.4	8.6	36.6	2.7	230.6	321.9
All growing-stock trees	2534.9	18.1	150.9	121.3	892.7	1351.9
Rough trees:						
Sawtimber size	141.8	0.8	...	6.0	59.0	75.9
Poletimber size	81.9	0.2	...	0.7	35.2	45.8
Total	223.7	1.0	...	6.7	94.2	121.8
Rotten trees:						
Sawtimber size	50.7	...	...	5.4	20.6	24.6
Poletimber size	2.9	...	...	...	0.8	2.1
Total	53.6	...	...	5.4	21.5	26.7
Salvable dead trees:						
Sawtimber size	11.3	...	...	...	3.0	8.4
Poletimber size	6.6	...	...	...	1.0	5.7
Total	18.0	...	...	...	3.9	14.0
All classes	2830.1	19.1	150.9	133.4	1012.3	1514.5

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 17—Volume of live trees and growing stock on timberland by ownership class and species group, Arkansas Delta, 1988

Ownership class	Live trees						Growing stock							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Planted	Pine		Other	Soft ¹		Hard ²	Planted	Pine		Other	Soft ¹	Hard ²
			Natural							Natural				
----- Million cubic feet -----														
National forest	56.3	...	...	...	13.9	42.4	51.9	...	...	...	13.0	38.9		
Other public	523.9	...	14.6	33.7	146.4	329.2	481.0	...	14.6	31.0	127.9	307.5		
Forest industry	417.0	7.1	52.9	19.1	198.2	139.8	381.7	6.9	52.9	18.2	173.4	130.2		
Other private	1814.8	12.0	83.3	80.6	649.9	989.1	1620.3	11.2	83.3	72.0	578.4	875.4		
All ownerships	2812.1	19.1	150.9	133.4	1008.3	1500.4	2534.9	18.1	150.9	121.3	892.7	1351.9		

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 18—Average net annual growth of growing stock and sawtimber on timberland by county and species group, Arkansas Delta, 1988

County	Growing stock						Sawtimber					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
----- Million cubic feet -----												
Arkansas	9.6	...	...	-0.1	3.3	6.3	34.9	...	...	-0.3	11.8	23.5
Chicot	2.3	...	...	...	1.2	1.1	14.1	...	...	0.1	10.0	4.0
Clay	3.7	...	...	0.1	0.6	3.0	20.7	...	...	0.2	4.1	16.4
Craighead	2.9	...	...	0.3	1.6	0.9	10.7	...	...	1.1	5.8	3.8
Crittenden ³	2.8	...	...	0.1	1.5	1.2	10.0	...	...	0.2	6.2	3.7
Cross ⁴	2.5	...	...	...	0.6	1.9	12.5	...	...	...	2.9	9.6
Desha	9.3	...	...	0.3	6.7	2.3	40.8	...	...	0.3	29.7	10.8
Greene	1.5	...	0.1	...	0.4	0.9	8.4	...	0.8	...	1.5	6.1
Jefferson	13.7	0.2	5.7	0.8	1.3	5.7	43.5	...	19.9	3.6	-0.4	20.3
Lawrence	1.9	...	...	...	0.4	1.6	10.3	...	...	0.3	1.3	8.7
Lee	4.2	...	...	0.1	1.7	2.5	26.2	...	...	0.2	11.1	14.9
Lincoln	7.3	0.1	3.5	-0.1	1.0	2.8	32.8	1.0	15.2	-0.2	4.1	12.8
Lonoke	3.4	...	...	0.2	0.6	2.5	13.9	...	...	1.2	2.2	10.4
Monroe	4.6	...	0.3	0.1	0.9	3.2	21.1	...	2.2	0.4	3.7	14.9
Phillips	2.4	...	...	...	1.2	1.2	15.4	...	...	...	7.1	8.3
Poinsett	2.7	...	...	0.2	0.4	2.2	17.8	...	...	0.9	2.9	14.0
Prairie	5.5	...	...	0.3	2.9	2.3	20.4	...	0.2	0.9	10.6	8.6
St. Francis	3.0	...	...	...	0.7	2.3	10.3	...	...	...	1.6	8.7
Woodruff	3.5	...	...	...	1.4	2.1	17.5	...	...	0.4	4.6	12.5
All counties	86.6	0.4	9.8	2.3	28.4	45.7	381.3	1.0	38.2	9.3	120.6	212.2

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

³ Mississippi included in Crittenden.

⁴ Jackson included in Cross.

Table 19—Average net annual removals of growing stock and sawtimber on timberland by county and species group, Arkansas Delta, 1988

County	Growing stock						Sawtimber							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard ²
-----Million cubic feet-----						-----Million board feet-----								
Arkansas	0.8	...	...	0.1	0.3	0.4	4.9	...	...	0.7	2.1	2.1		
Chicot	2.4	...	...	...	1.1	1.3	9.1	...	...	...	3.6	5.5		
Clay	...	...	...	...	...	...	...	...	...	...	...	...		
Craighead	0.6	...	...	...	...	0.6	0.6	...	...	...	...	0.6		
Crittenden ³	1.2	...	...	0.1	1.0	0.2	6.0	...	...	0.4	5.2	0.4		
Cross ⁴	1.6	...	...	...	...	1.6	7.8	...	...	...	...	7.8		
Desha	2.1	...	...	0.5	0.9	0.8	10.5	...	...	3.0	4.0	3.6		
Greene	1.4	...	0.1	...	0.5	0.7	4.0	...	0.3	0.1	1.8	1.9		
Jefferson	10.2	...	4.7	...	0.9	4.6	40.2	...	22.9	...	4.0	13.3		
Lawrence	1.4	...	...	...	0.2	1.2	4.1	...	...	...	0.7	3.3		
Lee	5.9	...	...	...	1.1	4.7	27.5	...	...	...	4.7	22.8		
Lincoln	4.2	0.3	2.1	...	0.8	1.2	13.4	0.6	8.5	...	2.6	1.7		
Lonoke	...	...	...	...	...	...	...	...	...	...	...	...		
Monroe	5.6	...	0.2	...	1.0	4.4	26.7	...	0.8	...	4.0	21.9		
Phillips	1.6	...	...	...	0.9	0.7	7.7	...	...	...	5.0	2.7		
Poinsett	0.3	...	...	...	...	0.3	...	...	...	...	...	...		
Prairie	0.6	...	...	...	0.4	0.2	3.7	...	...	...	2.5	1.2		
St. Francis	0.7	...	...	0.1	0.1	0.5	2.9	...	...	0.2	0.7	2.0		
Woodruff	3.3	...	...	...	1.2	2.1	12.6	...	...	...	3.6	9.0		
All counties	44.1	0.3	7.1	0.8	10.5	25.5	181.8	0.6	32.6	4.3	44.5	99.9		

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

³ Mississippi included in Crittenden.

⁴ Jackson included in Cross.

Table 20—Average net annual growth and average annual removals of growing stock on timberland by species, Arkansas Delta, 1988

Species	Growth	Removals
- - - - Million cubic feet - - - -		
Yellow pines	10.2	7.3
Other softwoods	2.3	0.8
Total softwoods	12.4	8.1
Select white-red oaks	7.4	4.8
Other white-red oaks	23.8	12.6
Hickory	5.1	4.6
Hard maple	...	...
Sweetgum	8.2	1.8
Ash-walnut-black cherry	6.8	2.6
Yellow-poplar	0.3	...
Other hardwoods	22.5	9.6
Total hardwoods	74.2	36.0
All species	86.6	44.1

Table 21—Average net annual growth and average annual removals of sawtimber on timberland by species, Arkansas Delta, 1988

Species	Growth	Removals
- - - - Million board feet - - - -		
Yellow pines	39.2	33.1
Other softwoods	9.3	4.3
Total softwoods	48.5	37.4
Select white-red oaks	36.3	20.1
Other white-red oaks	118.7	48.6
Hickory	26.2	17.6
Sweetgum	33.8	7.3
Ash-walnut-black cherry	22.4	10.7
Yellow-poplar	2.6	...
Other hardwoods	92.9	40.1
Total hardwoods	332.8	144.4
All species	381.3	181.8

Table 22—Average annual mortality of growing stock and sawtimber on timberland by species, Arkansas Delta, 1988

Species	Growing stock	Sawtimber
- - Million cubic feet - - Million board feet - -		
Yellow pines	1.3	2.5
Other softwoods	0.3	0.9
Total softwoods	1.6	3.5
Select white-red oaks	2.0	6.8
Other white-red oaks	7.5	18.5
Hickory	3.5	11.2
Sweetgum	2.1	6.6
Ash-walnut-black cherry	1.5	4.3
Other hardwoods	13.3	47.5
Total hardwoods	29.9	95.0
All species	31.5	98.4

Table 23—Average net annual growth and average annual removals of growing stock on timberland by ownership class and species group, Arkansas Delta, 1988

Ownership class	Growth						Removals					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
-----Million cubic feet-----												
National forest	0.8	...	...	...	0.3	0.4	...	...	...	...	...	...
Other public	16.6	...	0.4	0.3	4.9	11.1	3.5	...	1.7	0.2	0.8	0.8
Forest industry	15.8	0.2	5.5	0.4	4.6	5.2	7.3	...	1.9	0.3	1.4	3.8
Other private	53.4	0.1	4.0	1.6	18.6	29.1	33.3	0.3	3.5	0.3	8.4	20.9
All ownerships	86.6	0.4	9.8	2.3	28.4	45.7	44.1	0.3	7.1	0.8	10.5	25.5

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 24—Average net annual growth and average annual removals of sawtimber on timberland by ownership class and species group, Arkansas Delta, 1988

Ownership class	Growth						Removals					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
-----Million board feet-----												
National forest	6.1	...	...	...	2.8	3.3	...	...	...	...	...	...
Other public	65.3	...	0.6	0.7	15.9	48.0	18.8	...	9.5	1.0	4.1	4.2
Forest industry	60.7	...	13.7	1.3	23.2	22.5	30.9	...	6.8	2.1	5.6	16.4
Other private	249.2	1.0	23.9	7.3	78.7	138.5	132.1	0.6	16.3	1.2	34.8	79.3
All ownerships	381.3	1.0	38.2	9.3	120.6	212.2	181.8	0.6	32.6	4.3	44.5	99.9

¹ Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

² Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 25—Volume of sawtimber on timberland by species and tree grade, Arkansas Delta, 1988

Species	All grades	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
----- Million board feet -----						
Yellow pines	619.1	185.4	116.9	313.2	...	3.7
Cypress	596.1	143.2	151.9	186.1	...	114.9
Redcedar	3.2	3.2	...	...	...	...
Total softwoods	1218.4	331.8	268.8	499.3	...	118.6
Select white-red oaks	917.0	90.4	302.8	394.4	83.6	45.8
Other white-red oaks	2664.0	180.9	641.2	1119.7	527.9	194.3
Hickory	936.0	41.6	216.8	540.1	105.4	32.0
Sweetgum	764.5	117.1	240.6	318.1	55.0	33.8
Tupelo and blackgum	229.1	20.5	40.1	131.3	3.4	33.8
Ash-walnut-black cherry	431.9	53.7	107.2	215.4	11.4	44.3
Yellow-poplar	57.3	17.9	7.6	21.4	2.7	7.7
Other hardwoods	2482.4	176.4	334.3	1400.8	312.0	258.9
Total hardwoods	8482.1	698.6	1890.6	4141.1	1101.4	650.6
All species	9700.6	1030.3	2159.3	4640.4	1101.4	769.2

Supplemental Tables 26–36

Table 26—Area of timberland by stand age, forest type group and type of regeneration, Arkansas Delta, 1988

Stand age class	Pine		Oak-pine		Other hardwood types	
	Artificial	Natural	Artificial	Natural	Artificial	Natural
----- Thousand acres -----						
1-10	5.3	...	5.3	...	6.7	37.1
11-20	5.3	10.7	...	...	...	5.3
21-30	5.1	5.3	...	...	5.6	5.2
31-40	...	5.3	...	...	...	5.3
41-50	...	5.3	...	6.7	...	6.7
>50	...	...	...	...	...	8.2
Mixed	13.3	30.7	6.7	26.6	...	1687.3
Total	29.0	57.3	12.0	33.3	12.2	1755.1

Table 27—Volume of softwood growing stock on timberland by forest type, Arkansas Delta, 1988

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress	Elm-ash- cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Arkansas	13.9	...	...	...	...	13.9	...
Chicot	0.4	...	...	...	...	0.2	0.2
Clay	0.4	...	...	...	...	0.4	...
Craighead	9.4	...	...	...	0.4	5.3	3.7
Crittenden ¹	4.8	...	...	...	...	4.6	0.2
Cross ²	...	...	...	...	...	...	...
Desha	20.6	...	...	...	...	20.6	...
Greene	9.6	...	...	5.7	3.9	...	...
Jefferson	104.1	6.2	50.0	15.3	17.0	15.6	...
Lawrence	1.3	...	...	...	1.3	...	...
Lee	3.1	...	...	...	...	3.1	...
Lincoln	60.7	4.8	38.9	6.3	8.5	2.2	...
Lonoke	5.6	3.5	...	...	...	2.2	...
Monroe	33.2	...	...	4.7	3.3	25.2	...
Phillips	0.7	...	...	...	...	0.7	...
Poinsett	2.5	...	...	...	...	0.2	2.3
Prairie	8.5	...	...	...	0.4	8.0	...
St. Francis	0.5	...	...	...	...	0.5	...
Woodruff	10.8	...	...	...	...	10.8	...
All counties	290.3	14.5	89.0	32.0	34.8	113.6	6.4

¹ Mississippi included in Crittenden.

² Jackson included in Cross.

Table 28—Volume of hardwood growing stock on timberland by forest type, Arkansas Delta, 1988

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress	Elm-ash- cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Arkansas	282.9	...	...	...	56.4	208.3	18.2
Chicot	100.9	...	...	...	...	74.7	26.2
Clay	118.8	...	...	...	8.7	110.0	...
Craighead	45.4	...	...	...	8.3	25.8	11.3
Crittenden ¹	69.1	...	...	...	...	34.4	34.7
Cross ²	99.0	...	...	...	58.0	41.0	...
Desha	232.7	...	...	...	...	193.4	39.2
Greene	57.5	...	...	6.1	48.1	3.3	...
Jefferson	181.0	2.7	5.6	7.7	52.4	97.8	14.8
Lawrence	52.1	...	...	...	23.6	28.5	...
Lee	163.0	...	...	...	34.4	89.5	39.0
Lincoln	111.9	1.8	1.5	7.0	54.2	44.1	3.4
Lonoke	67.4	...	...	...	11.0	56.4	...
Monroe	194.2	...	...	2.8	17.3	174.0	...
Phillips	114.0	...	...	...	47.1	66.9	...
Poinsett	74.5	...	...	...	17.1	53.0	4.5
Prairie	133.9	...	...	...	18.4	115.4	...
St. Francis	68.5	...	...	...	14.5	54.0	...
Woodruff	77.9	...	...	...	...	77.9	...
All counties	2244.6	4.5	7.1	23.6	469.5	1548.6	191.4

¹ Mississippi included in Crittenden.² Jackson included in Cross.

Table 29—Volume of softwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, Arkansas Delta, 1988

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress	Elm-ash- cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Arkansas	12.9	...	...	...	...	12.9	...
Chicot	0.3	...	...	...	...	0.2	0.2
Clay	0.3	...	...	...	...	0.3	...
Craighead	7.6	...	...	...	...	4.3	3.2
Crittenden ¹	3.7	...	...	...	...	3.7	...
Cross ²	...	...	...	...	...	...	...
Desha	17.9	...	...	...	...	17.9	...
Greene	7.5	...	...	4.4	3.1	...	...
Jefferson	62.0	...	27.9	10.4	10.7	13.1	...
Lawrence	0.6	...	...	...	0.6	...	...
Lee	2.8	...	...	...	...	2.8	...
Lincoln	40.2	2.0	26.3	4.7	5.3	1.9	...
Lonoke	4.7	2.8	...	...	...	1.9	...
Monroe	29.3	...	...	2.7	2.4	24.2	...
Phillips	0.7	...	...	...	...	0.7	...
Poinsett	2.5	...	...	...	...	0.2	2.3
Prairie	7.8	...	...	...	0.4	7.4	...
St. Francis	0.4	...	...	...	...	0.4	...
Woodruff	9.3	...	...	...	...	9.3	...
All counties	210.8	4.8	54.2	22.2	22.4	101.4	5.7

¹ Mississippi included in Crittenden.

² Jackson included in Cross.

Table 30—Volume of hardwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, Arkansas Delta, 1988

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress	Elm-ash- cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Arkansas	194.6	...	...	...	38.9	146.3	9.4
Chicot	70.8	...	...	...	...	53.8	17.0
Clay	75.7	...	...	...	4.7	71.0	...
Craighead	26.9	...	...	...	3.9	15.0	8.0
Crittenden ¹	42.0	...	...	...	...	16.5	25.5
Cross ²	52.8	...	...	...	33.1	19.7	...
Desha	155.6	...	...	...	...	131.9	23.7
Greene	35.7	...	...	3.9	30.5	1.4	...
Jefferson	107.9	0.3	2.7	4.4	24.6	62.9	13.1
Lawrence	29.5	...	...	...	10.8	18.7	...
Lee	118.5	...	...	...	24.2	58.0	36.3
Lincoln	67.3	1.0	...	2.5	27.2	33.7	2.8
Lonoke	39.1	...	...	...	6.7	32.4	...
Monroe	118.9	...	...	1.6	8.4	108.9	...
Phillips	75.5	...	...	...	35.7	39.8	...
Poinsett	52.5	...	...	...	12.0	36.4	4.0
Prairie	87.8	...	...	...	8.3	79.5	...
St. Francis	41.2	...	...	...	6.2	35.0	...
Woodruff	43.8	...	...	...	...	43.8	...
All counties	1436.1	1.3	2.7	12.3	275.2	1004.7	139.8

¹ Mississippi included in Crittenden.

² Jackson included in Cross.

Table 31—*Volume of timber on timberland by county, class of timber and species group, Arkansas Delta, 1988*

County	All classes	Growing stock		Rough		Rotten	
		Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
----- <i>Million cubic feet</i> -----							
Arkansas	321.5	13.9	282.9	1.3	16.9	1.2	5.2
Chicot	119.3	0.4	100.9	...	16.3	...	1.7
Clay	127.8	0.4	118.8	...	7.6	...	0.9
Craighead	66.3	9.4	45.4	0.5	8.7	...	2.3
Crittenden ¹	79.4	4.8	69.1	...	3.8	0.5	1.2
Cross ²	113.4	...	99.0	...	10.5	...	3.9
Desha	279.2	20.6	232.7	1.0	20.1	1.4	3.4
Greene	73.0	9.6	57.5	...	4.5	...	1.4
Jefferson	292.6	104.1	181.0	0.5	6.5	...	0.4
Lawrence	63.5	1.3	52.1	0.3	7.8	...	2.0
Lee	182.4	3.1	163.0	...	13.1	...	3.2
Lincoln	186.2	60.7	111.9	1.4	11.3	...	0.9
Lonoke	88.7	5.6	67.4	1.3	11.4	1.4	1.6
Monroe	249.8	33.2	194.2	...	20.3	...	2.1
Phillips	132.9	0.7	114.0	...	14.9	...	3.3
Poinsett	84.8	2.5	74.5	0.5	6.0	...	1.2
Prairie	168.7	8.5	133.9	0.9	17.8	0.3	7.3
St. Francis	81.0	0.5	68.5	...	7.4	...	4.6
Woodruff	101.6	10.8	77.9	...	11.0	0.5	1.4
All counties	2812.1	290.3	2244.6	7.7	216.0	5.4	48.2

¹ Mississippi included in Crittenden.

² Jackson included in Cross.

Table 32—Number of live trees on timberland by detailed species and diameter class, Arkansas Delta, 1988

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----													
Shortleaf pine	12452	3491	3425	2460	1105	835	569	355	126	36	21	28	...
Loblolly pine	32810	7946	12468	5468	3287	1375	1248	537	191	145	49	91	4
Redcedar	4404	2768	1165	332	60	79	...	...	...	...	...	...	...
Cypress	4328	489	...	521	373	658	611	441	221	290	135	350	239
Total softwoods	53994	14694	17058	8780	4826	2947	2428	1334	538	471	206	469	24
Select white oaks	31158	17921	3497	3762	1409	1327	1199	716	600	243	237	226	20
Select red oaks	14587	6909	3190	932	599	437	602	425	291	372	267	525	37
Other white oaks	57603	24043	12123	6011	4587	3198	2227	1505	1293	901	572	947	195
Other red oaks	87196	42547	16371	7685	6004	4211	2821	2227	1886	1170	865	1135	274
Sweet pecan	9404	6215	659	936	530	351	171	150	68	62	93	136	34
Water hickory	25787	13287	5235	1933	1826	1155	906	436	325	232	170	224	58
Other hickories	57948	36997	9584	3620	3172	1652	1381	824	348	202	86	82	...
Persimmon	23253	16646	2093	2449	1009	601	320	72	37	26	...	...	...
Hard maple	5996	4307	1504	...	124	61	...	...	...	...	...	...	...
Soft maple	36274	22175	10690	1774	631	330	289	118	100	52	70	27	19
Boxelder	19421	9950	3893	2093	1854	395	552	367	210	56	44	8	...
Beech	3370	1504	1504	...	...	...	81	...	48	74	39	121	...
Sweetgum	82003	50514	11998	7381	5056	2654	1704	1039	669	450	195	265	78
Blackgum	23625	19131	2468	587	378	446	199	153	103	59	41	59	...
Other gums/tupelos	13825	2598	4764	1667	1527	1135	683	224	229	231	132	416	220
White ash	4013	2860	530	128	198	92	...	105	13	10	11	64	3
Other ashes	72828	41792	17577	4433	3194	2163	1099	982	614	417	209	304	46
Sycamore	1353	...	...	197	125	222	256	114	133	75	46	182	4
Cottonwood	7771	2775	2246	325	190	393	350	347	333	249	181	316	66
Yellow-poplar	356	...	...	142	...	26	...	49	55	29	27	20	8
Willow	15226	3608	3593	1341	2444	1035	562	529	561	604	394	507	48
Black walnut	972	919	...	...	...	53	...	...	...	...	...	...	...
Black cherry	4387	2423	979	683	301	...	...	...	...	...	...	...	...
American elm	32444	19429	6109	2212	2092	1253	479	353	138	117	139	87	37
Other elms	64793	46883	9971	3740	2225	618	616	322	169	95	55	91	8
River birch	217	...	...	82	62	41	23	...	...	...	...	7	3
Hackberry	61831	30245	11078	5887	5042	3500	1747	1516	1213	691	498	394	20
Black locust	1379	1379	...	...	...	...	...	...	...	...	...	...	...
Other locusts	7159	3557	530	556	1188	454	378	222	103	38	58	68	7
Sassafras	704	560	...	109	...	...	...	22	...	13	...	...	...
Dogwood	29834	27654	1604	575	...	...	...	...	...	...	...	...	...
Other commercial	6240	5510	...	200	452	79	...	...	...	...	...	...	...
Total hardwoods	802958	464338	143788	61439	46219	27880	18646	12819	9540	6466	4427	6209	118
Noncommercial	87631	62769	16620	5768	1759	358	167	54	51	23	9	55	...
All species	944584	541802	177466	75986	52805	31185	21240	14206	10129	6960	4642	6733	1428

Table 33—*Number of growing-stock trees on timberland by detailed species and diameter class, Arkansas Delta, 1988.*

Species	Diameter class (inches at breast height)										
	All classes	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Thousand trees-----											
Shortleaf pine	5536	2460	1105	835	569	355	126	36	21	28	...
Loblolly pine	12228	5331	3287	1375	1248	537	177	145	49	73	4
Redcedar	379	239	60	79	...	...	...	...	...	...	...
Cypress	3018	319	327	376	430	388	221	290	135	332	200
Total softwoods	21161	8349	4779	2666	2247	1280	525	471	206	433	205
Select white oaks	8916	3454	1206	1258	1131	660	551	243	191	205	15
Select red oaks	3936	667	599	331	569	405	291	314	257	470	34
Other white oaks	18465	5166	3956	2961	1740	1228	1100	821	512	817	163
Other red oaks	25348	6251	5767	4047	2462	2061	1780	1016	801	1005	159
Sweet pecan	2440	936	479	351	171	129	68	51	86	136	34
Water hickory	5984	1648	1491	825	703	401	294	220	143	215	45
Other hickories	10503	3237	2971	1513	1329	808	296	189	86	74	...
Persimmon	3124	1372	883	509	261	36	37	26	...	...	...
Hard maple	185	...	124	61	...	...	...	...	...	...	...
Soft maple	2985	1515	631	284	219	101	100	52	61	14	8
Boxelder	2890	1192	889	231	260	129	121	34	27	8	...
Beech	294	...	...	...	81	...	48	74	27	63	...
Sweetgum	17966	7046	4489	2374	1516	998	594	438	186	249	76
Blackgum	1699	587	378	335	101	131	61	45	21	41	...
Other gums/tupelos	5413	1309	1527	1135	397	159	173	145	76	330	163
White ash	598	128	198	92	...	105	...	10	11	55	...
Other ashes	11463	3682	3013	1792	772	812	521	385	191	266	29
Sycamore	1232	197	58	222	227	114	133	75	46	156	4
Cottonwood	2671	325	190	393	350	330	313	249	164	295	62
Yellow-poplar	197	...	...	26	...	33	55	29	27	20	8
Willow	6472	1262	2021	550	429	418	428	563	359	419	24
Black walnut	53	...	...	53	...	...	...	...	...	...	...
Black cherry	745	683	61	...	...	...	...	...	...	...	...
American elm	5560	1720	1587	1126	407	315	103	89	120	80	13
Other elms	5771	2275	1889	458	485	282	156	95	46	76	8
River birch	207	82	62	41	23	...	...	...	...	...	...
Hackberry	15877	4609	3675	2845	1226	1141	1032	600	412	325	11
Other locusts	2321	462	956	341	270	149	46	21	22	46	7
Sassafras	131	109	...	...	...	22	...	...	...	...	...
Dogwood	128	128	...	...	...	...	...	...	...	...	...
Other commercial	450	200	250	...	...	...	...	...	...	...	...
Total hardwoods	164023	50243	39351	24154	15129	10968	8301	5782	3870	5363	863
All species	185184	58592	44130	26820	17376	12248	8825	6253	4076	5796	1068

Table 34—Volume of growing-stock trees on timberland by species and diameter class, Arkansas Delta, 1988

Species	Diameter class (inches at breast height)										
	All classes	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
-----Million cubic feet-----											
Shortleaf pine	58.7	6.0	7.4	10.2	13.3	10.5	5.6	2.3	1.6	1.9	...
Loblolly pine	110.2	12.9	18.9	16.5	22.6	14.3	7.3	7.1	3.1	7.0	0.6
Redcedar	1.3	0.3	0.3	0.7	...	...	...	...	...	...	...
Cypress	120.0	0.7	1.4	3.6	7.2	8.6	6.7	13.6	8.8	24.9	44.5
Total softwoods	290.3	19.9	28.0	31.0	43.1	33.5	19.6	23.0	13.5	33.7	45.0
Select white oaks	116.0	7.3	5.3	11.6	18.7	16.5	16.9	9.4	11.5	16.7	2.0
Select red oaks	98.8	1.7	3.8	3.3	9.5	9.0	8.9	12.4	13.5	32.5	4.1
Other white oaks	260.5	10.6	18.3	25.8	23.8	23.6	31.4	30.2	23.6	54.1	19.2
Other red oaks	410.6	14.7	33.2	42.4	38.8	47.6	54.2	41.1	41.3	76.9	20.4
Sweet pecan	44.3	2.5	2.7	3.6	2.7	3.3	2.0	2.4	4.6	13.8	6.5
Water hickory	93.9	3.5	7.8	8.4	11.6	8.4	9.2	9.0	7.4	19.7	8.8
Other hickories	106.3	6.5	13.9	13.7	23.4	19.9	9.1	8.8	5.5	5.7	...
Persimmon	22.7	3.5	5.3	6.0	4.9	0.9	0.8	1.3	...	...	...
Hard maple	1.4	...	0.7	0.7	...	...	...	...	...	...	...
Soft maple	24.4	3.7	3.3	2.8	3.2	2.1	2.6	2.4	2.8	0.6	0.8
Boxelder	20.9	3.0	4.3	2.3	3.6	2.4	2.7	1.3	0.9	0.4	...
Beech	11.4	...	...	...	1.5	...	1.4	3.3	1.5	3.7	...
Sweetgum	214.3	15.6	23.8	27.1	27.7	26.5	22.5	21.1	11.7	22.2	16.1
Blackgum	15.7	1.1	1.4	2.9	1.5	2.6	1.7	1.3	0.8	2.4	...
Other gums/tupelos	70.6	3.1	7.7	9.9	5.2	2.6	4.1	4.3	2.8	17.2	13.8
White ash	8.5	0.4	1.0	1.1	...	1.8	...	0.4	0.3	3.5	...
Other ashes	129.8	8.4	15.7	18.0	12.1	17.1	13.9	14.4	8.8	18.5	2.9
Sycamore	35.9	0.6	0.5	2.3	3.8	3.1	4.6	3.6	2.7	13.9	0.9
Cottonwood	96.7	1.1	1.3	5.1	6.7	8.8	11.4	12.3	11.2	28.4	10.4
Yellow-poplar	10.4	...	...	0.5	...	1.1	2.1	1.4	1.4	2.5	1.4
Willow	124.4	2.6	10.7	4.8	7.5	8.8	14.4	24.2	17.7	31.6	2.0
Black walnut	0.6	...	...	0.6	...	...	...	...	...	...	...
Black cherry	1.7	1.5	0.2	...	...	...	...	...	...	...	...
American elm	52.5	3.7	7.7	9.7	6.3	6.5	3.4	2.7	5.1	5.8	1.5
Other elms	52.1	4.9	10.6	4.4	7.9	6.6	4.7	3.8	2.2	5.7	1.2
River birch	1.1	0.3	0.2	0.3	0.3	...	...	...	...	...	...
Hackberry	194.4	9.1	19.0	27.2	17.9	24.5	31.4	23.8	19.5	20.7	1.3
Other locusts	22.5	1.0	4.1	3.4	3.8	3.0	1.4	0.6	1.2	2.9	1.2
Sassafras	0.7	0.3	...	...	...	0.4	...	...	...	...	...
Dogwood	0.1	0.1	...	...	...	...	...	...	...	...	...
Other commercial	1.4	0.7	0.7	...	...	...	...	...	...	...	...
Total hardwoods	2244.6	111.6	203.1	237.9	242.6	247.4	254.8	235.4	197.8	399.6	114.5
All species	2534.9	131.4	231.1	268.8	285.7	280.8	274.4	258.4	211.3	433.3	159.6

Table 35—*Volume of growing stock in the saw-log portion of sawtimber trees on timberland by detailed species and diameter class, Arkansas Delta, 1988*

Species	All classes	Diameter class (inches at breast height)							
		9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million cubic feet -----									
Shortleaf pine	38.0	7.7	11.4	9.3	4.9	2.2	1.3	1.4	...
Loblolly pine	65.0	13.0	18.8	12.2	6.6	5.9	2.5	5.6	0.5
Redcedar	0.6	0.6	...	...	...	...	...	...	...
Cypress	107.1	2.1	5.7	7.3	6.1	12.8	8.3	23.4	41.5
Total softwoods	210.8	23.4	35.8	28.7	17.6	20.8	12.1	30.4	42.0
Select white oaks	76.4	...	14.0	14.0	14.4	7.9	9.9	14.3	1.8
Select red oaks	77.4	...	7.0	7.8	7.6	11.0	12.2	28.1	3.7
Other white oaks	173.8	...	18.0	19.5	26.2	26.0	19.9	46.5	17.8
Other red oaks	271.9	...	27.9	40.0	46.2	35.9	36.3	67.2	18.4
Sweet pecan	31.2	...	2.2	2.8	1.7	2.0	3.9	12.3	6.2
Water hickory	62.0	...	8.4	7.0	7.9	7.8	6.7	16.9	7.4
Other hickories	58.1	...	17.5	16.4	7.6	7.2	4.6	4.8	...
Persimmon	6.7	...	4.0	0.8	0.7	1.2	...	...	...
Soft maple	12.0	...	2.3	1.6	2.2	2.2	2.5	0.5	0.8
Boxelder	8.9	...	2.6	2.0	2.1	1.1	0.8	0.3	...
Beech	9.2	...	1.0	...	1.2	2.4	1.2	3.4	...
Sweetgum	126.5	...	19.3	22.5	19.8	18.7	10.7	20.3	15.2
Blackgum	8.9	...	1.0	2.2	1.5	1.2	0.8	2.2	...
Other gums/tupelos	42.6	...	2.9	2.0	3.2	3.6	2.5	15.3	13.1
White ash	5.3	...	...	1.3	...	0.4	0.3	3.3	...
Other ashes	73.5	...	8.7	12.8	12.1	12.5	7.9	16.8	2.7
Sycamore	28.6	...	2.6	2.6	4.1	3.5	2.2	12.7	0.9
Cottonwood	79.6	...	5.2	7.4	10.1	11.0	10.2	25.9	9.8
Yellow-poplar	9.1	...	...	1.0	1.9	1.2	1.3	2.3	1.4
Willow	95.0	...	5.2	7.5	12.9	22.2	16.1	29.2	1.8
American elm	25.9	...	5.1	5.1	2.8	2.3	4.2	5.2	1.2
Other elms	27.3	...	5.9	5.6	4.0	3.4	1.8	5.5	1.0
River birch	0.3	...	0.3	...	...	...	...	...	...
Hackberry	114.6	...	12.9	20.1	25.7	19.9	17.0	17.9	1.0
Other locusts	11.0	...	2.4	2.6	1.1	0.5	1.0	2.5	1.1
Sassafras	0.3	...	...	0.3	...	...	...	...	...
Total hardwoods	1436.1	...	176.3	205.0	217.0	205.2	174.0	353.3	105.2
All species	1646.8	23.4	212.2	233.7	234.6	226.0	186.1	383.6	147.2

**Table 36—Volume of timber on timberland by species and class of timber,
Arkansas Delta, 1988**

Species	All live	Growing stock	Rough	Rotten
----- Million cubic feet -----				
Shortleaf pine	58.7	58.7	...	...
Loblolly pine	111.3	110.2	1.0	...
Redcedar	1.5	1.3	0.3	...
Cypress	131.8	120.0	6.4	5.4
Total softwoods	303.3	290.3	7.7	5.4
Select white oaks	122.0	116.0	5.1	0.9
Select red oaks	105.0	98.8	3.9	2.2
Other white oaks	287.9	260.5	22.0	5.5
Other red oaks	445.2	410.6	26.1	8.5
Sweet pecan	45.4	44.3	1.0	...
Water hickory	104.1	93.9	8.9	1.3
Other hickories	111.3	106.3	5.0	...
Persimmon	26.8	22.7	4.1	...
Hard maple	1.4	1.4	...	...
Soft maple	28.5	24.4	3.1	1.1
Boxelder	34.5	20.9	12.2	1.5
Beech	17.0	11.4	2.0	3.5
Sweetgum	224.7	214.3	8.7	1.6
Blackgum	19.4	15.7	2.8	0.9
Other gums/tupelos	87.0	70.6	7.7	8.8
White ash	9.2	8.5	0.3	0.4
Other ashes	144.8	129.8	12.6	2.4
Sycamore	37.3	35.9	0.7	0.7
Cottonwood	99.5	96.7	2.0	0.9
Yellow-poplar	11.1	10.4	0.7	...
Willow	138.3	124.4	11.8	2.1
Black walnut	0.6	0.6	...	...
Black cherry	2.2	1.7	0.6	...
American elm	61.7	52.5	8.4	0.9
Other elms	60.4	52.1	7.7	0.6
River birch	1.3	1.1	...	0.2
Hackberry	227.5	194.4	29.5	3.5
Other locusts	29.7	22.5	6.2	1.1
Sassafras	1.2	0.7	0.5	...
Dogwood	0.7	0.1	0.6	...
Other commercial	2.3	1.4	1.0	...
Total hardwoods	2488.0	2244.6	195.2	48.2
Noncommercial	20.8	...	20.8	...
All species	2812.1	2534.9	223.7	53.6

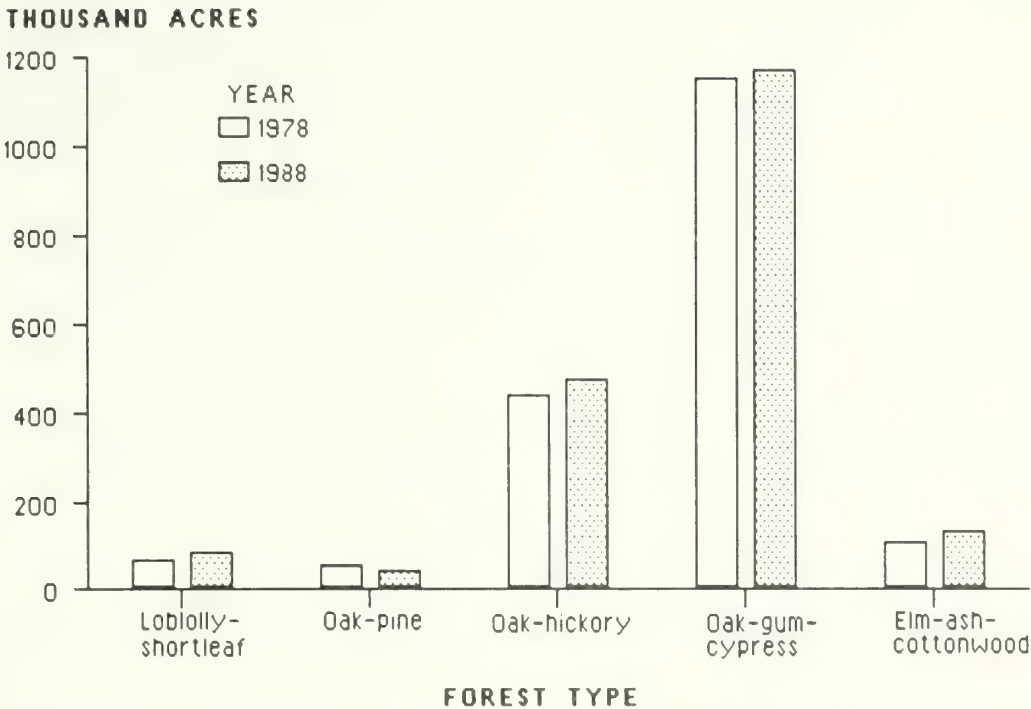


Figure 1.--Area of timberland by forest type, Arkansas Delta, 1978 and 1988.

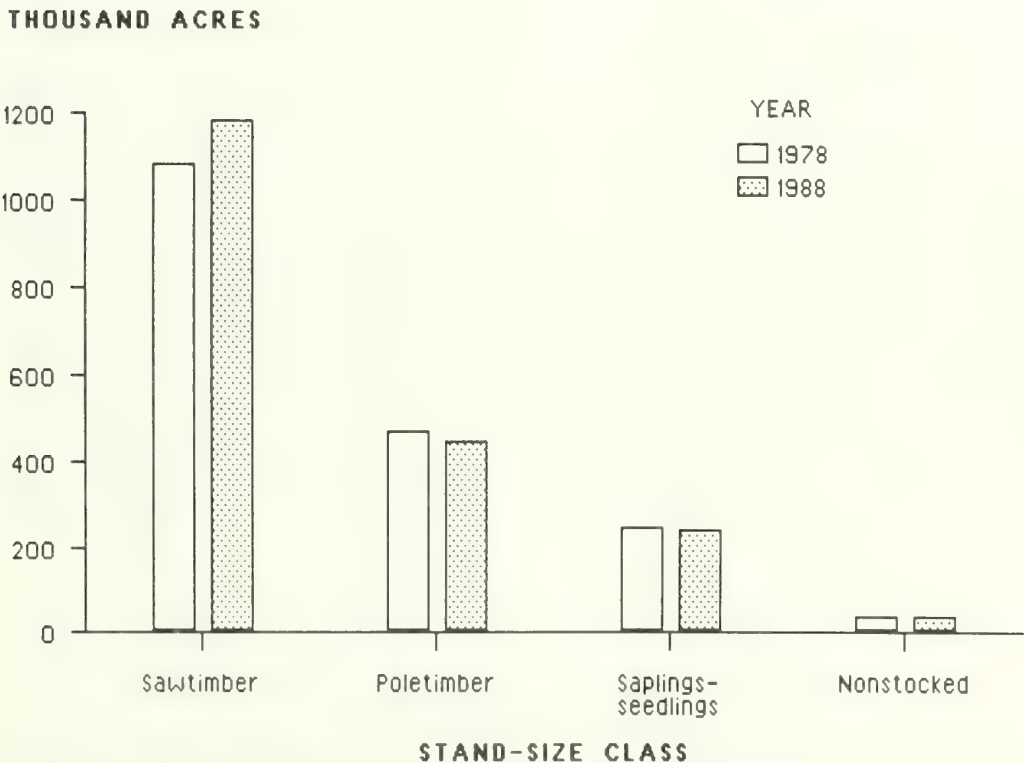
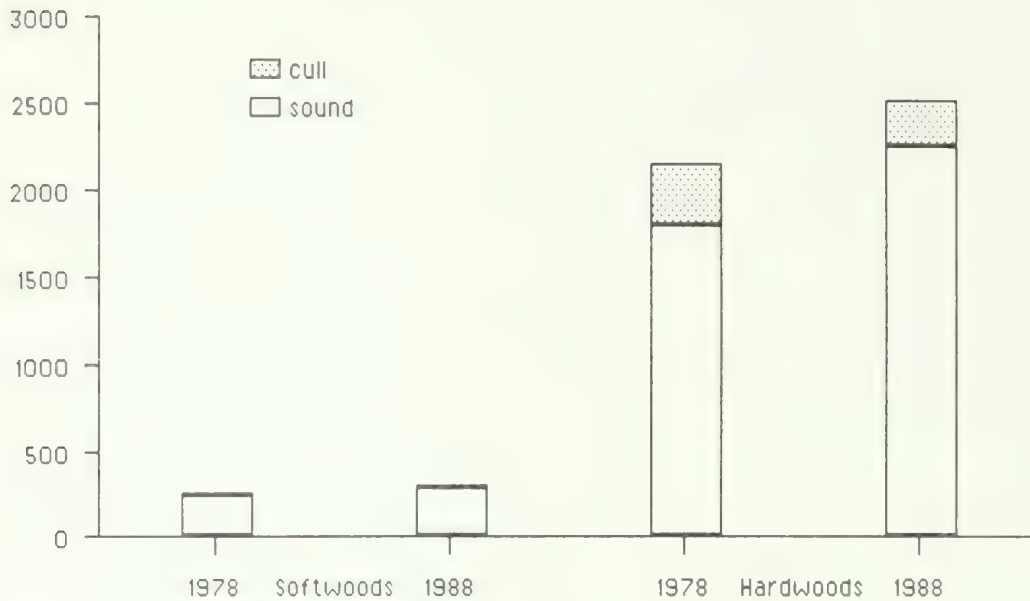


Figure 2.--Area of timberland by stand-size class, Arkansas Delta, 1978 and 1988.

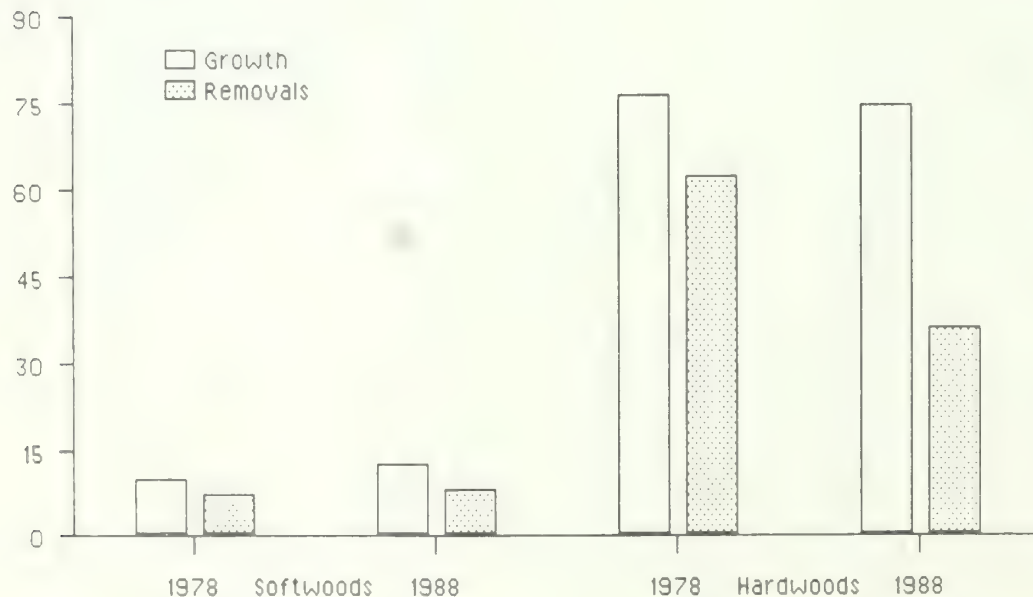
MILLION CUBIC FEET



YEAR AND SPECIES GROUP

Figure 3.--Volume of timber on timberland by species group and class of timber, Arkansas Delta, 1978 and 1988.

MILLION CUBIC FEET



YEAR AND SPECIES GROUP

Figure 4.--Average net annual growth and average annual removals of growing stock on timberland by species group, Arkansas Delta, 1978 and 1988.

MILLION CUBIC FEET

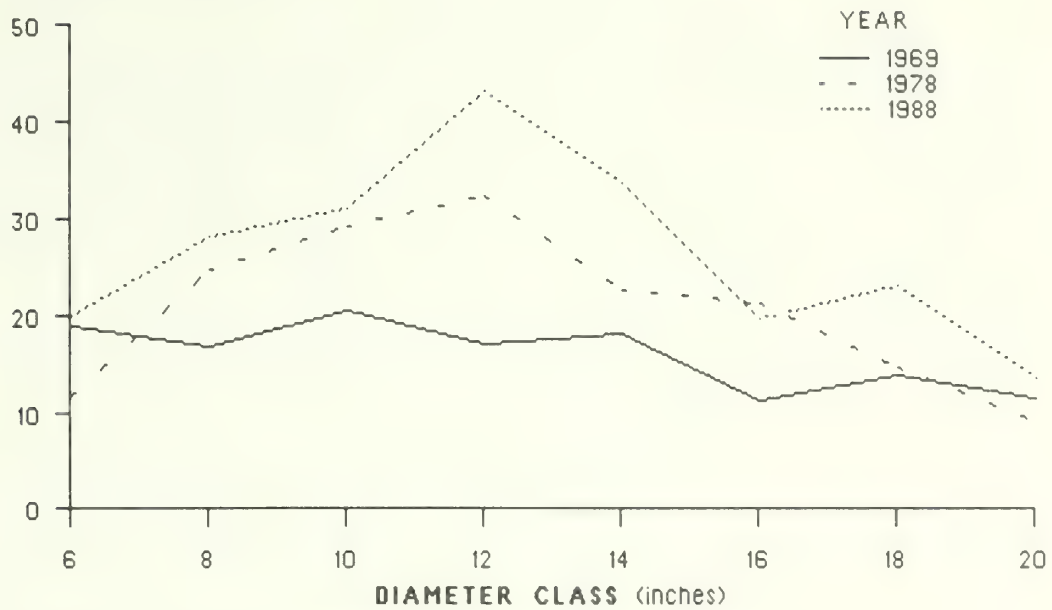


Figure 5.--Volume of softwood growing stock on timberland by diameter class, Arkansas Delta, 1969, 1978, and 1988.

MILLION CUBIC FEET

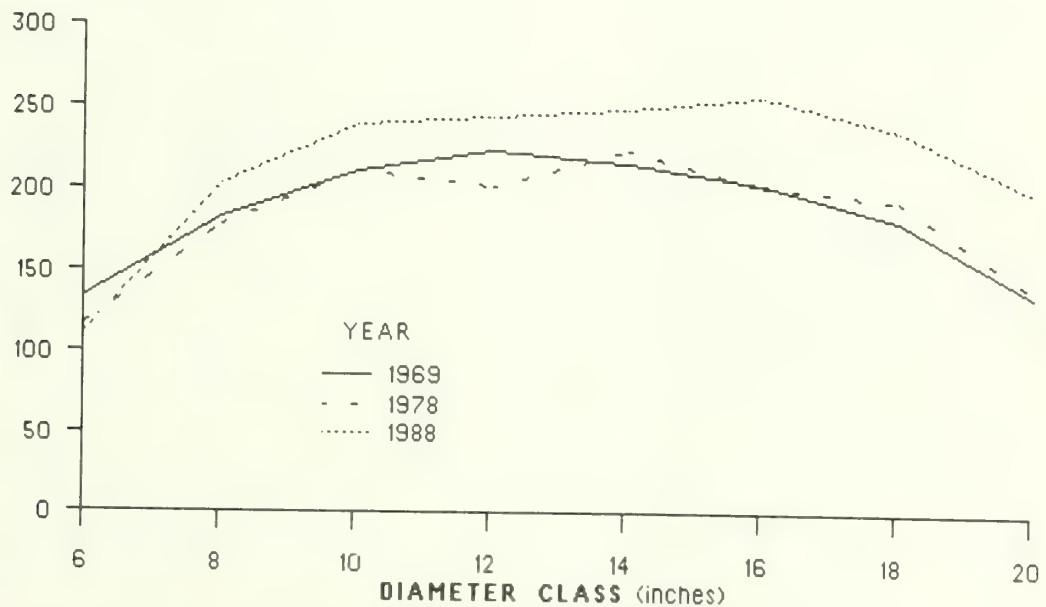


Figure 6.--Volume of hardwood growing stock on timberland by diameter class, Arkansas Delta, 1969, 1978, and 1988.

MILLION TREES

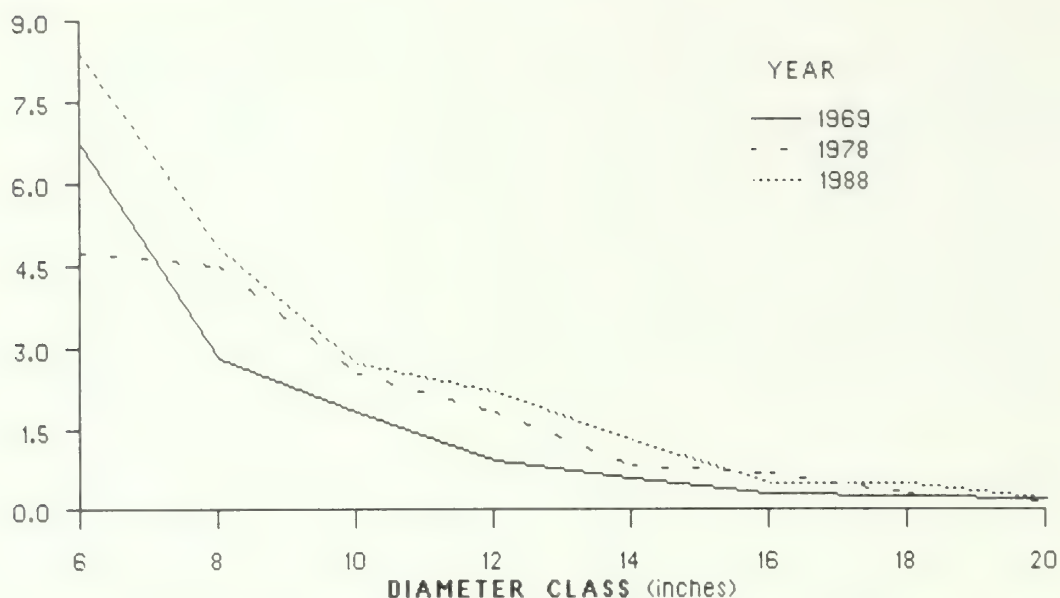


Figure 7.--Number of softwood growing-stock trees on timberland by diameter class, Arkansas Delta, 1969, 1978, and 1988.

MILLION TREES

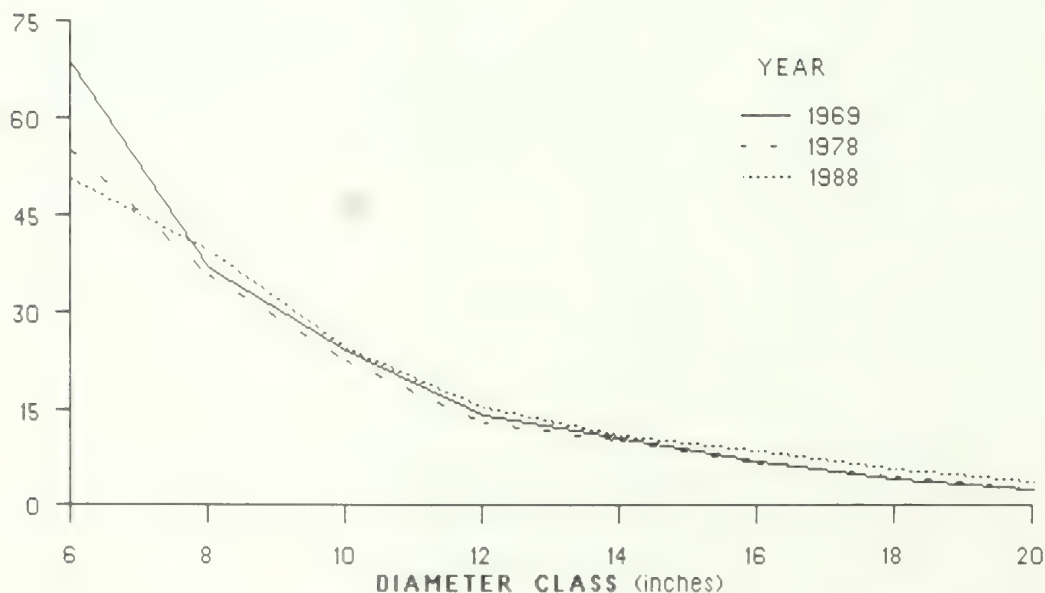


Figure 8.--Number of hardwood growing-stock trees on timberland by diameter class, Arkansas Delta, 1969, 1978, and 1988.

PERCENT CHANGE

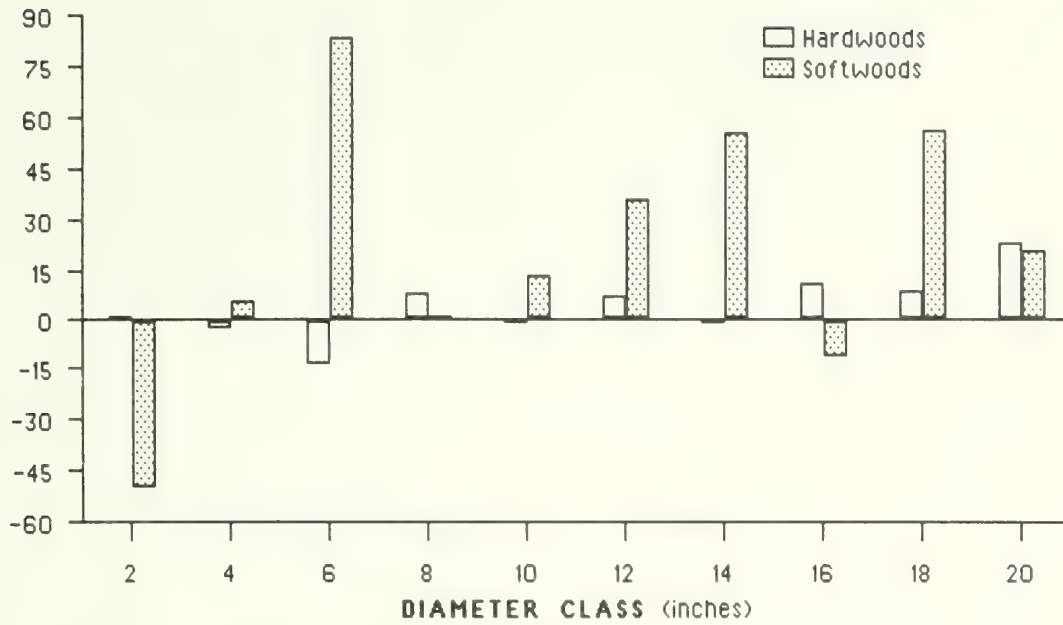


Figure 9.--Percent change in the number of live trees on timberland by species group and diameter class, Arkansas Delta, 1978 and 1988.

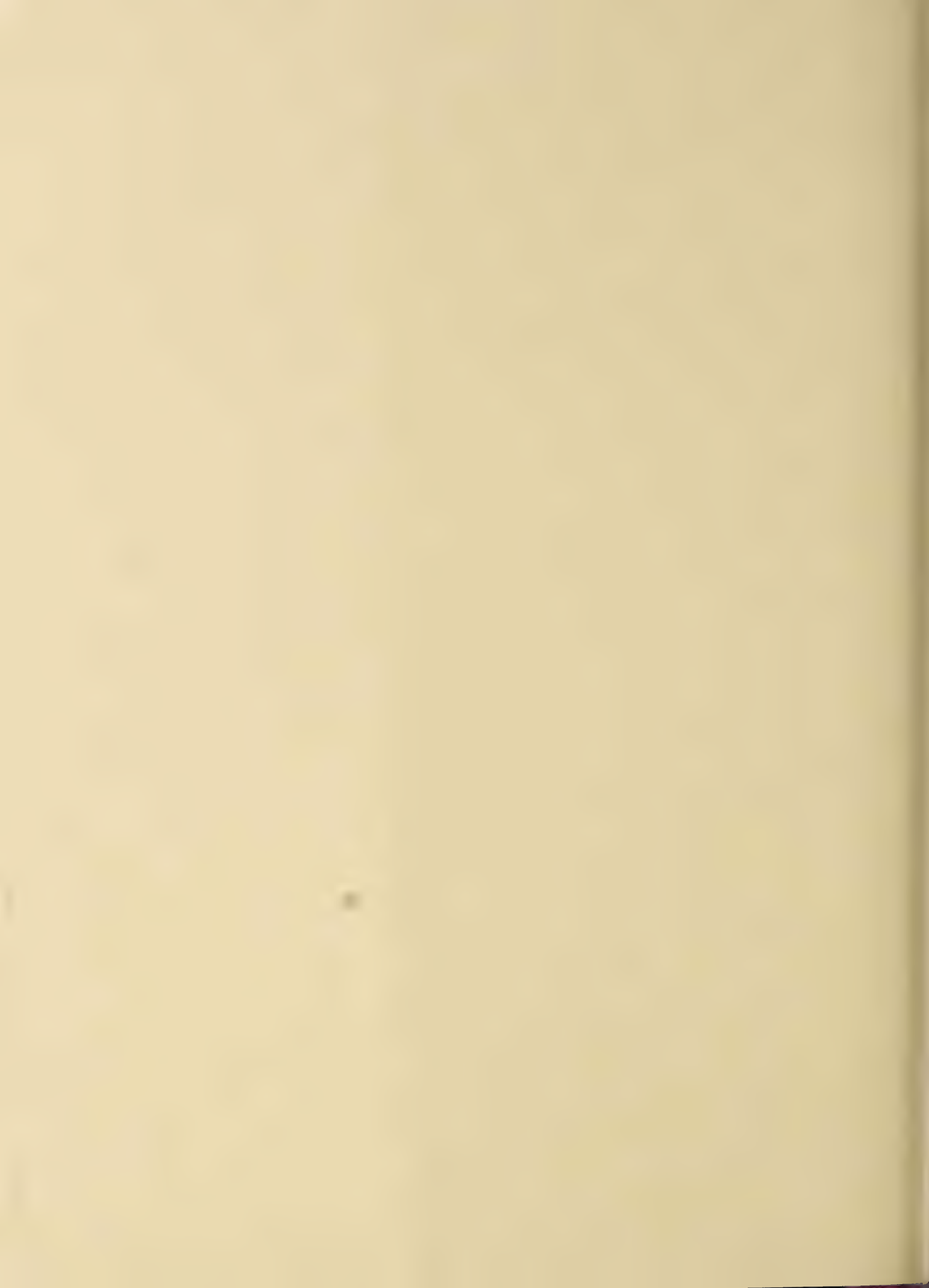
Hines, F. Dee, Forest Statistics for Arkansas' Delta Counties—1988. Resource Bull. SO-133 . New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 1988. 39 p.

Tabulates forest resource information from a new inventory of Arkansas' Delta Unit.

Additional Keywords: Area, volume, forest type, stand size, ownership.

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Forest Growth of Mississippi's North Unit—A Case Study of the Southern Forest Survey's Growth Estimation Procedures

Dennis M. May



SUMMARY

This report presents the procedures by which the Southern Forest Inventory and Analysis unit estimates forest growth from permanent horizontal point samples. Inventory data from the 1977-87 survey of Mississippi's north unit were used to demonstrate how trees on horizontal point samples are classified into one of eight components of growth (survivor growth, ingrowth, mortality growth, cut growth, cull increment, mortality, cut, or landclearing) and, in turn, how these components are combined to derive estimates of forest growth (gross growth, net growth, and net change). Results indicate that the current growth estimation procedures provide reasonable and unbiased estimates of growth, removals, and mortality while providing statistically additive estimates of net change.

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Dennis M. May

INTRODUCTION

One objective of the Southern Forest Inventory and Analysis (FIA) unit is to periodically assess forest growth (gross growth, net growth, and net change) for each state in the Midsouth region. Before the 1980 survey of Tennessee, growth estimates were calculated for the calendar year prior to the year of the inventory, with the inventory being dated on the January 1 closest to the midpoint of the field work in a state. These growth estimates were composed of six main components: survivor growth, ingrowth, growth on ingrowth, growth on cut, mortality, and cut. Periodic annual estimates of the first five were derived from permanent horizontal point samples (HPS). The last component (cut) was derived mainly from canvasses of forest industry timber consumption. Estimates of other removals (trees that were killed for stand improvement, killed by logging, or removed in landclearings) derived from permanent HPS were also included in the cut component. As a result, the growth estimates were a mixture of sample estimates and deterministic measures. During the 1980 survey of Tennessee, the transition to calculating all growth components from permanent HPS was made. By the 1982 survey of Alabama, the Beers and Miller (1964) approach to estimating growth and growth components from permanent HPS was incorporated into the Southern FIA data reduction procedures.

Alabama's growth estimates using the Beers and Miller approach were criticized because the old inventory plus the net change did not sum to the new inventory. Under this approach to forest growth estimation, unbiased estimates of forest growth can be obtained. Additivity, however, is not assured because of 1) inter-survey population differences caused by additions to or deletions from the forest land base due to reversions or landclearings and 2) differences in successive HPS caused by trees growing onto the points over the survey period. The trees that grow onto the HPS can be divided into two types: those that were of merchantable size at the first survey (nongrowth) and those that were not (ongrowth) (Martin 1982). Under the Beers and Miller approach, only ongrowth trees are accounted for in the growth estimation procedures, hence the problem of additivity due to the exclusion of nongrowth trees. To

continue to provide unbiased estimates of growth, as well as enhance additivity, the Southern FIA adopted the growth estimation procedures proposed by Van Deusen, Dell, and Thomas (1986). Their approach employs a new estimator of survivor growth for remeasured HPS that adjusts for the nongrowth trees excluded by the Beers and Miller approach, thus alleviating one of the reasons for nonadditivity. This "additive" approach has been in place in the Southern FIA data reduction procedures since the 1984 survey of Louisiana. To date, it has been used in Texas, Oklahoma, and Mississippi.

CURRENT GROWTH ESTIMATION PROCEDURES

Although minor refinements have been made to accommodate state-to-state changes in field techniques, the growth estimation procedures have remained essentially the same for all states subsequent to Louisiana 1984. Currently, separate estimates of growth are calculated for the growing-stock and sawtimber portions of the inventory. With the use of attribute filters (appendices 1, 2 and 3) trees on Southern FIA plots (permanent HPS) are processed into one of the following growth components or subcomponents thereof:

Survivor Growth

Survivors.—Trees that survived from the first survey to the second survey and were of merchantable size and growing-stock quality in both surveys. Estimates of survivor growth for these trees are based on the difference between the volume and number of trees in the second survey and the volume and number of trees in the first survey—the change in volume to basal area ratio.

Nongrowth.—Trees that grew onto the plot over the survey period and fell outside the plot defined by the limiting distance of the minimum size merchantable tree and were of merchantable size (based on predicted past diameter) and growing-stock quality in both surveys. Their estimates of survivor growth are based on the volume and number of trees in the second survey.

Ingrowth

Ingrowth.—Trees that were tallied and of submer-

chantable size in the first survey but were of merchantable size and growing-stock quality in the second survey.

Ongrowth.—Trees that grew onto the plot over the survey period and fell within the plot defined by the limiting distance of the minimum size merchantable tree or were of submerchantable size in the first survey (based on predicted past diameter), but were of merchantable size and growing-stock quality in the second survey. The estimates of ingrowth for both subcomponents are based on the volumes and numbers of trees in the second survey.

Mortality Growth

Mortality.—Trees of merchantable size and growing-stock quality in the first survey that died before the second survey. Estimates of mortality growth for them are based on the volume change between the first survey and the time of death and the past number of trees.

Mortality Ingrowth.—Trees that were tallied and of submerchantable size and growing-stock quality in the first survey that grew to merchantable size and died before the second survey. Estimates of mortality growth for these trees are based on the volume at the time of death and the past number of trees.

Cut Growth

This component accounts for the growth of trees that were cut (trees removed for timber products, killed during logging, or killed for stand improvements) during the intersurvey period. The cut growth component handles cut trees in the same manner that the mortality growth component handles dead trees.

Cull Increment

These are trees that changed tree classes between surveys (from growing-stock quality to cull or vice versa), resulting in an imbalance in the growth estimates due to trees being included in one survey but not the other. These trees fall into one of the two following subcomponents:

Sound to Cull.—Trees of merchantable size that were of growing-stock quality in the first survey but cull in the second survey. Balance is attained by subtracting a volume estimate based on the volume and number of trees in the first survey from the growth estimates.

Cull to Sound.—Trees of merchantable size that were cull in the first survey but of growing-stock quality in the second survey. Balance is attained by adding a volume estimate based on the volume and number of trees in the second survey to the growth estimates.

Mortality

This component is composed of the same two subcomponents that make up the mortality growth component. The estimates of mortality volume for both

subcomponents are based on the volume at the time of death and the number of trees at the first survey.

Cut

This component is handled in the same manner as the mortality component, except for the use of cut trees in place of mortality trees.

Landclearing

This component includes trees on forested plots that were of merchantable size and growing-stock quality in the first survey that, because of a land-use change, are classified as being on nonforest plots in the second survey. The estimates of the volumes landcleared are based on the volume and number of trees at the first survey.

The component volumes for each tree are expanded to the county level using the remeasured expansion factor. The remeasured expansion factor is the current number of forested acres represented by each remeasured plot in a county. Plots that have reverted to forest and those that have been cleared are not considered to be remeasured plots. As a result, reversions receive the average growth of remeasured plots in a county, and landclearing volume estimates are expanded to the county level by the expected expansion factor for a Southern FIA plot, 5,760 acres. Because reverted and cleared plots occur infrequently in most counties and the true number of acres they represent cannot be ascertained under the current sampling scheme, this method of handling reversion growth and landclearing removals is acceptable. From this point, the county level component volumes for each tree are either summed to yield periodic component estimates or divided by the intersurvey period for each plot and then summed to yield average annual component estimates. The algorithms used to process sample tree component volumes are shown in appendices 2 and 3. From the component estimates, county, unit, or state level estimates of forest growth (gross growth, net growth, and net change) can be derived.

**GROWTH ESTIMATES AND COMPONENTS
FOR MISSISSIPPI'S NORTH UNIT**

The recently completed 1977-87 inventory of the north unit of Mississippi provides an example of how forest growth estimates are derived from growth component estimates (table 1.). The growth components are logically organized into two categories—those that add to the initial inventory and those that subtract from it. The four components that increment the initial inventory are survivor growth, ingrowth, mortality growth, and cut growth. The sum of these four growth components is an estimate of gross growth.

Table 1.—Periodic growth components and estimates of gross growth, net growth, and inventory change for Mississippi's north unit, 1977-87¹

Growth estimate ²	Growth component	Subcomponent	Softwood	Hardwood	Total
-----Million cubic feet-----					
(+) Survivor growth		Survivors	272.2	270.2	542.4
		Nongrowth	625.7	723.1	1,348.8
		Total	897.9	993.3	1,891.2
(+) Ingrowth		Ingrowth	36.4	27.2	63.6
		Ongrowth	103.5	103.3	206.8
		Total	139.9	130.6	270.5
(+) Mortality growth		Mortality	46.0	25.1	71.1
		Mortality ingrowth	43.8	12.1	55.9
		Total	89.8	37.2	127.0
(+) Cut growth		Cut	240.1	95.8	335.9
		Cut ingrowth	42.1	20.7	62.8
		Total	282.2	116.5	398.7
Total Gross growth			1,409.7	1,277.7	2,687.4
(+) Cull increment		Sound to cull	-26.5	-120.3	-146.8
		Cull to sound	+14.9	+145.2	+160.1
		Total	-11.6	+24.9	+13.3
Total Adjusted gross growth			1,398.1	1,302.6	2,700.7
(–) Mortality		Mortality	161.6	170.5	332.1
		Mortality ingrowth	43.8	12.1	55.9
		Total	205.3	182.6	388.0
Total Net growth			1,192.8	1,119.9	2,312.7
(–) Cut		Cut	957.5	577.2	1,534.7
		Cut ingrowth	42.1	20.7	62.8
		Total	999.6	597.9	1,597.5
(–) Landclearing		Landclearing	69.2	108.2	177.3
(–) Total removal			1,068.8	706.1	1,774.9
Total Net change			124.0	413.8	537.8

¹Columns may not add due to rounding.

²(+) or (–) indicate whether the subcomponent increments or decrements the initial inventory.

Gross Growth

In the north unit, gross growth, the measure of the initial inventory's gross increase over the survey period, averaged 6.8 percent per year, for a total increase of 66.5 percent for the period. The survivor growth component constitutes 70 percent of the gross growth estimate. The nongrowth subcomponent, in turn, accounts for 70 percent of the survivor growth component. Because of the magnitude of the nongrowth subcomponent, which individually accounts for half of the gross growth estimate, the inclusion of nongrowth trees in the survivor growth component would seemingly overestimate growth. However, this is not the case. Under the current growth estimation procedures, nongrowth serves to offset the effect of survivor trees growing larger over the intersurvey period and having a corresponding smaller expansion to the acre (Van Deusen and others 1986, Martin 1982).

Ingrowth, the next component that serves to increment the initial inventory, contributes 10 percent of the gross growth estimate for the north unit. The ongrowth subcomponent accounts for three-quarters of this component's contribution to gross growth.

The contributions of the two remaining components

of gross growth, mortality growth and cut growth, are dependent upon three factors: 1) the amount of mortality or cut during the intersurvey period, 2) the growth rate of the trees before death or removal, and 3) the elapsed time between the initial survey and the time of death or removal. The combined effect of these three factors is the reason for cut growth's 15 percent contribution to the gross growth of the north unit being three times that of mortality growth.

Adjusted Gross Growth

Because the Southern FIA only estimates growth for the growing-stock portion of the inventory, the gross growth estimates must be adjusted to account for changes in tree class over the period, i.e., trees that changed from growing-stock to cull or vice versa because of tree deterioration, growth, or cruiser judgement. The changes in tree class cause imbalances in the growth estimates due to growing-stock trees being included in one survey but not the other. The adjustment is handled through the cull increment component, which can either increment or decrement the gross growth estimate, depending on the net result of summing the sound-to-cull

and cull-to-sound subcomponents. The sound-to-cull subcomponent accounts for trees that changed from growing stock to cull over the period and decreases the gross growth estimate. The cull-to-sound subcomponent accounts for trees that changed from cull to growing stock and increases the gross growth estimate.

In the north unit, cull increment has a positive net effect (more volume went from cull-to-sound than sound-to-cull), increasing the gross growth estimate by half of 1 percent. The sound-to-cull subcomponent is comprised of smaller trees than the cull-to-sound subcomponent. This indicates a tendency for cruisers to give smaller trees the benefit of the doubt when initially assigning a tree class, with the reclassification to cull occurring in subsequent surveys when the impacts of normal development and disturbances can be better assessed. In contrast, the cull-to-sound reclassification occurs more frequently in larger hardwood trees. This is primarily the result of cruiser subjectivity due to the higher incidence of decay and deformity within larger hardwoods.

Net Growth

Net growth is a measure of the increment of the initial inventory subsequent to the impacts of natural tree mortality. The mortality component accounts for the drain on the initial inventory caused by natural tree mortality. In the north unit, the vast majority, 86 percent, of the mortality component estimate is due to the death of larger trees accounted for in the mortality subcomponent. However, the mortality ingrowth subcomponent is also responsible for a sizeable proportion as a result of high levels of mortality in the smaller size classes due to tree competition as part of normal stand development. As might be expected then, this subcomponent's volume was concentrated in the generally more intolerant softwoods. The same estimate of mortality ingrowth is used in both the mortality growth and mortality components. As a result, mortality ingrowth has no net effect upon the net growth or net change estimates. But, because it does provide a better estimate of the mortality occurring over the period, it is included and will impact the gross growth estimate.

Decrementing the adjusted gross growth estimate for the impact of natural mortality results in a measure of the initial inventory's net growth. In the north unit, the initial inventory experienced an average mortality rate of 1.0 percent per year, resulting in an average net growth of 5.9 percent per year for the period. In total, the initial inventory increased by 57.2 percent over the period.

Net Change

Net change is a measure of the difference between the initial and final inventories. It is estimated by reducing

the net growth to account for the impacts of man-caused removals over the period. The man-caused removals are accounted for in the cut and landclearing components. Over the period, the north unit experienced an average removals rate of 4.5 percent per year, resulting in an average net change of 1.4 percent per year. On the whole, the initial inventory increased by 13.3 percent over the period. The cut component is responsible for 90 percent of the removals in the unit. Because of the preference for cutting trees in the larger diameter classes, the cut subcomponent accounts for almost all of the cut estimate. This subcomponent is mainly composed of larger trees that were cut and utilized, while the cut ingrowth subcomponent is composed of smaller trees that were mainly killed during logging. Although contributing a small proportion of the total cut estimate, the cut ingrowth subcomponent does provide a better estimate of the cut volume over the period. And like mortality ingrowth, equal estimates of cut ingrowth are included in the cut growth and cut components so that cut ingrowth has no net effect upon the net change estimate. It does, however, impact the gross and net growth estimates. Overall, cutting reduced the initial inventory of the north unit by an average of 4.1 percent per year over the period.

The landclearing component is responsible for the remainder of the total removals estimate. In contrast to the cut component, which is often composed predominantly of softwoods, the landclearing component is generally dominated by hardwoods because of the preference for bottomlands in agricultural conversions. Such was the case in the north unit, where hardwoods comprised over 60 percent of the landclearing component and the softwoods comprised over 60 percent of the cut component.

The ratio of growth to removals for the unit is 1.3, which bodes well for the inventory as a whole. When broken down by species group, the ratios are 1.1 for softwoods and 1.6 for hardwoods. These follow a south-wide trend of high utilization of the softwood resource and underutilization of the hardwood resource.

ADDITIVITY

A check for additivity requires consideration of sampling errors. The Southern FIA sampling scheme was designed to provide state-level estimates of forest area and volume with acceptable sampling errors. Sampling error is a function of the inherent variability of the population being sampled and the number of samples taken. In most cases, the larger the sample, the lower the sampling error. Therefore, forest resource statistics for sub-state areas and for finer breakdowns of volume (i.e., growth component volumes) will involve fewer samples and larger sampling errors. The additivity check for the north unit is shown in table 2. The predicted inventory volume (initial inventory plus net change) comes within

2 percent of the actual current inventory. Although not perfectly additive, the predicted inventory is well within the 3.1-percent sampling error of the 1987 inventory. A 95-percent confidence interval about the current inventory spans the range of 4,390.7 to 4,958.7 million cubic feet. This easily encompasses the predicted inventory volume.

Another way of testing the estimate of net change is to compare it with the inventory change (volume #2-volume #1). These two estimates of the intersurvey change (537.8 and 632.8 million cubic feet, respectively) differ by 95.0 million cubic feet. Given the sampling errors for each of these change estimates, (25.6 percent for the net change estimate and 20.7 percent for the inventory change estimate), they are not statistically different (appendix 4). Although mathematical additivity has not been achieved, statistical additivity has.

As expected, the additive approach yielded net change estimates that were almost identical to the inventory change estimates for remeasured plots (appendix 5). The cause of the variability in the net change estimate can best be described as the difference between the reconciled initial inventory, used to calculate net change, and the actual initial inventory, used to calculate inventory change. The difference is usually due to differences in volume estimation techniques or in field procedures. The first of these differences (volume estimation techniques) is ameliorated by matching trees in the initial inventory with trees in the current inventory. This ensures that the initial volume and the reconciled initial volume are the same for each remeasured tree. Since the initial and current volumes are calculated by using the same deterministic volume equation, any growth component changes are truly representative of biological change for each tree.

The second of these differences (field procedures) is an inherent part of the survey and will always be present. These field differences include trees missed in either survey, substituted plots or points because the original could not be found, substituted points because of proximity to nonforest conditions, inaccessible plots (which receive the average plot volume for the county), and forked trees that (because of growth) are now considered to have only one stem. The differences resulting from these add to the variability of the growth estimates, but fortunately they occur infrequently. They are also responsible for the minor difference between the plot volume totals for the actual initial inventory (661,000

cubic feet) and reconciled initial inventory (660,500 cubic feet).

Therefore, forest population differences due to additions to or deletions from the forest land base as a result of reversions or landclearings are responsible for most of the nonadditivity occurring in the north unit. As previously stated, the true number of reverted acres is unknown under the current sampling scheme. Thus, reverted plots receive the average growth for remeasured plots. Over a large enough sample (state-level), this method of allocating growth to reverted acres should work reasonably well because some reversions have inventory volumes and some do not. This approach, however, can cause additivity problems if there are not enough reverted plots without inventory volume to counterbalance those with inventory volume. In order for mathematical additivity to occur, the net change assigned to the reverted acres should match the inventory on the reverted acres. In most instances, this would certainly overestimate growth on the reverted acres over the period.

One other quirk with this method of handling reversion growth is that for counties where removals exceed growth, the net change volume assigned to the reverted acreage will be negative. Although cutting does occur on reversions, it seems reasonable that it would not be high enough to cause reversions to have negative net change estimates. Fortunately, this problem is relatively small.

The impact of the current method of handling reversion growth in the north unit can be approximated by determining the difference between the current inventory on the 66 reversions in the unit and the estimated net change assigned to the reversions. The current inventory for the 66 reversions was 197.7 million cubic feet, and the net change volume assigned to these reversions totaled 72.0 million cubic feet. This is 125.7 million cubic feet shy of mathematical additivity. This net change estimate translates to an annual change rate of 3.7 percent for the period, suggesting that the average growth assigned to the reversions was out of proportion to the actual inventory on the reversions. This is due in part to the 11 reversions that had no inventory volume but still had an average net change assigned. Therefore, predicting a reasonable estimate of reversion growth may be preferable to achieving additivity, which would result in even higher rates of change on reversions.

Additivity problems also show up with the current method of handling landcleared plots. In landclearings, the initial inventory of the plot is removed from the inventory. Since the actual number of landcleared acres is unknown, the expected number of acres a plot should represent (5,760) is used to expand the plot volumes to the county. Using 5,760 acres is a fair enough assumption given a large enough sample. However, additivity problems occur because the expected expansion factor seldom matches the initial inventory expansion factor. In the north unit, the estimated initial inventory of the

Table 2.—Additivity check for Mississippi's north unit, 1977-87

Additivity	Softwood	Hardwood	Total
	-----Million cubic feet-----		
Initial inventory, 1977	1,791.4	2,250.5	4,041.9
Net change	+124.0	+413.8	+537.8
Predicted current inventory, 1987	1,915.4	2,664.3	4,579.7
Actual current inventory, 1987	1,955.7	2,718.9	4,674.7
Difference	-40.3	-54.6	-95.0

35 cleared plots was 177.3 million cubic feet, while the actual initial inventory was 191.0 million cubic feet. In terms of additivity, landclearing volume was underestimated.

When both landclearing and reversion additivity problems are taken into account, the net change for the unit is underestimated by 112.1 million cubic feet. When the net change estimate is adjusted for this difference, the estimated inventory comes within 0.4 percent of the actual inventory. However, because the number of acres reverted or landcleared over the period is unknown, the effects upon additivity can only be estimated and should only serve to reveal two major sources of nonadditivity in the Southern FIA net change estimates.

In conclusion, all forest survey statistics are sample estimates and each has an associated sampling error. For estimates of forest growth, the variability of the estimates can be quite large. With this in mind, as well as an understanding of some of the major sources of variability and nonadditivity in the growth estimates, the growth components provide reasonable and unbiased estimates of the unit's growth, removals, and mortality while providing a statistically additive estimate of net change.

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Appendix 1.—Definitions

Current—refers to the second survey or time of death for mortality and cut trees.

Past—refers to the first survey.

Ground use—20 = forest

> 20=nonforest due to land-use change

Sample kind—4 or 6=remeasured plots

Tree class and past tree class—10 and 20=growing stock trees

30=rough cull

40=rotten cull

D.b.h.—must be at least 5.0 inches to be included in growing stock growth. Softwoods must be at least 9.0 inches to be included in sawtimber growth, and hardwoods must be at least 11.0 inches to be included in sawtimber growth.

Tree size—3=sawtimber

2=pole

1=sapling

Tree histories—1, 11, 12, 15=survivor trees

3=ongrowth tree

21, 22=mortality trees

31, 32, 33, 34=cut trees

35, 36, 37, 38=landclearing trees (21, 22 also included if on a landcleared plot)

Distance—7.1 feet=limiting distance for minimum size (5.0-inch) growing stock growth tree.

12.8 feet=limiting distance for minimum size (9.0-inch) softwood sawtimber growth tree.

15.6 feet=limiting distance for minimum size (11.0-inch) hardwood sawtimber growth tree.

Elapsed time—refers to the intersurvey period (in years).

Rem. exp. factor—refers to the remeasured expansion factor=acres represented by one remeasured plot in a county at the time of the second survey or 5,760 acres/plot for landclearing plots.

Appendix 2.—Mississippi Growth Components and Tree Filters for Growing Stock, 1987

Growing Stock (in cubic feet)

Gross growth = survivor growth + ingrowth + mortality growth + cut growth

Adjusted gross growth = gross growth - sound to cull + cull to sound

Net growth = adjusted gross growth - mortality

Net change = net growth - cut - landclearing

Survivor growth = (a + b)

(a) Sum of [(current volume * current trees/acre - past volume * past tree/acre) * rem. exp. factor/elapsed time]

Filters: ground use = 20

sample kind = 4 or 6

tree class = 20

past tree class = 10 or 20

d.b.h. and past d.b.h. > = 5.0 inches

tree histories = 1, 11, 12, 15

(b) Nongrowth = sum of (current volume * current trees/acre * rem. exp. factor/elapsed time)

Additional filters: tree history = 3

distance > 7.1 feet

past d.b.h. > = 5.0 inches

Ingrowth

Sum of (current volume * current trees/acre * rem. exp. factor/elapsed time)

Filters: ground use = 20

sample kind = 4 or 6

tree class = 20

d.b.h. > = 5.0 inches

past d.b.h. < 5.0 inches

tree histories = 1, 11, 12, 15

Additional filters for ongrowth trees:

tree history = 3

distance < = 7.1 feet or past d.b.h. < 5.0

Mortality growth = (a + b)

(a) Sum of [(current volume - past volume) * past trees/acre * rem. exp. factor/elapsed time]

Filters: ground use = 20

sample kind = 4 or 6

past tree class = 10 or 20

d.b.h. and past d.b.h. > = 5.0 inches

tree histories = 21 or 22

(b) Sum of (current volume * past trees/acre * rem. exp. factor/elapsed time)

Filters: ground use = 20

sample kind = 4 or 6

past tree class = 10 or 20

d.b.h. > = 5.0 inches

past d.b.h. < 5.0 inches

tree histories = 21 or 22

Cut growth = (a + b)

(a) Sum of [(current volume - past volume) * past tree/acre * rem. exp. factor/elapsed time]

Filters: ground use = 20

sample kind = 4 or 6

past tree class = 10 or 20

d.b.h. and past d.b.h. > = 5.0 inches

tree histories = 31, 32, 33, 34

(b) Sum of (current volume * past trees/acre * rem. exp. factor/elapsed time)

Filters: ground use = 20

sample kind = 4 or 6

past tree class = 10 or 20

d.b.h. > = 5.0 inches

past d.b.h. < 5.0 inches

tree histories = 31, 32, 33, 34

Mortality

Sum of (current volume * past trees/acre * rem. exp. factor/elapsed time)

Filters: ground use = 20

sample kind = 4 or 6

past tree class = 10 or 20

d.b.h. and past d.b.h. > = 5.0 inches

tree histories = 21 or 22

Additional filters for mortality ingrowth trees:

d.b.h. > = 5.0 inches

past d.b.h. < 5.0 inches

Cut

Sum of (current volume * past trees/acre * rem. exp. factor/elapsed time)

Filters: ground use = 20

sample kind = 4 or 6

past tree class = 10 or 20

d.b.h. and past d.b.h. > = 5.0 inches

tree histories = 31, 32, 33, 34

Additional filters for cut ingrowth trees:

d.b.h. > = 5.0 inches

past d.b.h. < 5.0 inches

Landclearing

Sum of (past volume * past trees/acre * rem. exp. factor/elapsed time)

Filters: ground use > 20

past tree class = 10 or 20

past d.b.h. > = 5.0 inches

tree histories = 21, 22, 35, 36, 37, 38

Cull increment

Sound to cull = sum of (past volume * past trees/acre * rem. exp. factor/elapsed time)

Filters: ground use = 20

sample kind = 4 or 6

tree class > 20

past tree class = 10 or 20

past d.b.h. > = 5.0 inches

tree history = 11

Cull to sound = sum of (current volume * current trees/acre * rem. exp. factor/elapsed time)

Filters: ground use = 20

sample kind = 4 or 6

tree class = 20

past tree class > 20

past d.b.h. > = 5.0 inches

tree history = 11

Appendix 3—Mississippi Growth Components and Tree Filters for Sawtimber, 1987

Sawtimber (in board feet-International $\frac{1}{4}$ rule)

Gross growth = survivor growth + ingrowth + mortality growth + cut growth

Adjusted gross growth = gross growth - sound to cull + cull to sound

Net growth = adjusted gross growth - mortality

Net change = net growth - cut - landclearing

Survivor growth = (a + b)

(a) Sum of [(current volume * current trees/acre - past volume * past trees/acre) * rem. exp. factor/elapsed time]

Filters: ground use = 20

sample kind = 4 or 6

tree class = 20

tree size and past tree size = 3

tree histories = 1, 11, 12, 15

(b) Nongrowth = sum of (current volume * current trees/acre * rem. exp. factor/elapsed time)

Additional filters: tree history = 3

softwood-distance > 12.8 feet and past

d.b.h. > = 9.0 inches

hardwood-distance > 15.6 feet and past

d.b.h. > = 11.0 inches

Ingrowth

Sum of (current volume * current trees/acre * rem. exp. factor/elapsed time)

Filters: ground use = 20

sample kind = 4 or 6

tree class = 20

tree size = 3

past tree size < 3

tree histories = 1, 11, 12, 15

Additional filters for ongrowth trees:

tree history = 3

softwood-distance < = 12.8 feet or past

d.b.h. < 9.0 inches

hardwood-distance < = 15.6 feet or past

d.b.h. < 11.0 inches

Mortality growth = (a + b)

(a) Sum of [(current volume - past volume) * past trees/acre * rem. exp. factor/elapsed time]

Filters: ground use = 20

sample kind = 4 or 6

past tree class = 10 or 20

tree size and past tree size = 3

tree histories = 21 or 22

(b) Sum of (current volume * past trees/acre * rem. exp. factor/elapsed time)

Filters: ground use = 20

sample kind = 4 or 6

past tree class = 10 or 20

tree size = 3

past tree size < 3

tree histories = 21 or 22

Cut growth = (a + b)

(a) Sum of [(current volume - past volume) * past trees/acre * rem. exp. factor/elapsed time]

Filters: ground use = 20

sample kind = 4 or 6

past tree class = 10 or 20

tree size and past tree size = 3

tree histories = 31, 32, 33, 34

(b) Sum of (current volume * past trees/acre * rem. exp. factor/elapsed time)

Filters: ground use = 20

sample kind = 4 or 6

past tree class = 10 or 20

tree size = 3

past tree size < 3

tree histories = 31, 32, 33, 34

Mortality

Sum of (current volume * past trees/acre * rem. exp. factor/elapsed time)

Filters: ground use = 20

sample kind = 4 or 6

past tree class = 10 or 20

tree size and past tree size = 3

tree histories = 21 or 22

Additional filters for mortality ingrowth trees:

tree size = 3

past tree size < 3

Cut

Sum of (current volume * past trees/acre * rem. exp. factor/elapsed time)

Filters: ground use = 20

sample kind = 4 or 6

past tree class = 10 or 20

tree size and past tree size = 3

tree histories = 31, 32, 33, 34

Additional filters for cut ingrowth trees:

tree size = 3

past tree size < 3

Landclearing

Sum of (past volume * past trees/acre * rem. exp. factor/elapsed time)

Filters: ground use > 20

past tree class = 10 or 20

past tree size = 3

tree histories = 21, 22, 35, 36, 37, 38

Cull increment

Sound to cull = sum of (past volume * past trees/acre * rem. exp. factor/elapsed time)

Filters: ground use = 20

sample kind = 4 or 6

tree class > 20

past tree class = 10 or 20

past tree size = 3

tree history = 11

Cull to sound = sum of (current volume * current
trees/acre * rem. exp. factor/
elapsed time)

Filters: ground use = 20

sample kind = 4 or 6

tree class = 20

past tree class > 20

past tree size = 3

tree history = 11

Appendix 4.—Test for equality between the means of net change and inventory change estimates expanded to county level ¹

VARIABLE: VOL.										
Method ²	N	MEAN	STD DEV	STD ERROR	MINIMUM	MAXIMUM	VARIANCES	T	DF	PROB > |T|
1	689	780599.468795	5237961.32335	199550.433858	-24627064.0000	18592476.0000	UNEQUAL	-0.2050	1395.1	0.8376
2	758	834764.084433	4763964.78976	173107.636446	-20747108.0000	14844834.0000	EQUAL	-0.2060	1445.0	0.8369

¹FOR HO: VARIANCES ARE EQUAL, F¹ = 1.21 WITH 688 AND 757 DF, PROB > F¹ = 0.0112, SAS t-test procedure.

²Method 1—plot level net change estimates.

Method 2—plot level inventory change estimates.

Appendix 5.—Test for equality between the means of net change and inventory change estimates for remeasured plots¹

VARIABLE: VOL.										
Method ²	N	MEAN	STD DEV	STD ERROR	MINIMUM	MAXIMUM	VARIANCES	T	DF	PROB > |T|
1	654	164.46685321	733.98258550	28.70099029	-3140.15300000	2026.20400000	UNEQUAL	-0.0714	1305.8	0.9431
2	654	167.38160245	742.01958390	29.01526180	-2892.80700000	2026.18700000	EQUAL	-0.0714	1306.0	0.9431

¹FOR HO: VARIANCES ARE EQUAL, F¹ = 1.02 WITH 653 AND 653 DF, PROB > F¹ = 7809, SAS t-test procedure.

²Method 1—plot level net change estimates.

Method 2—plot level inventory change estimates.

May, Dennis M. Forest growth of Mississippi's north unit—a case study of the Southern Forest Survey's growth estimation procedures. Resour. Bull. SO-134. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 1988. 9 p.

Data collected from a 1977-87 survey in north Mississippi are used to demonstrate how trees on horizontal point samples are classified into one of eight growth components and, in turn, how these components are combined to derive estimates of forest growth.

Additional keywords: gross growth, net growth, net change, additivity.



United States
Department of
Agriculture

Forest Service

Southern Forest
Experiment Station

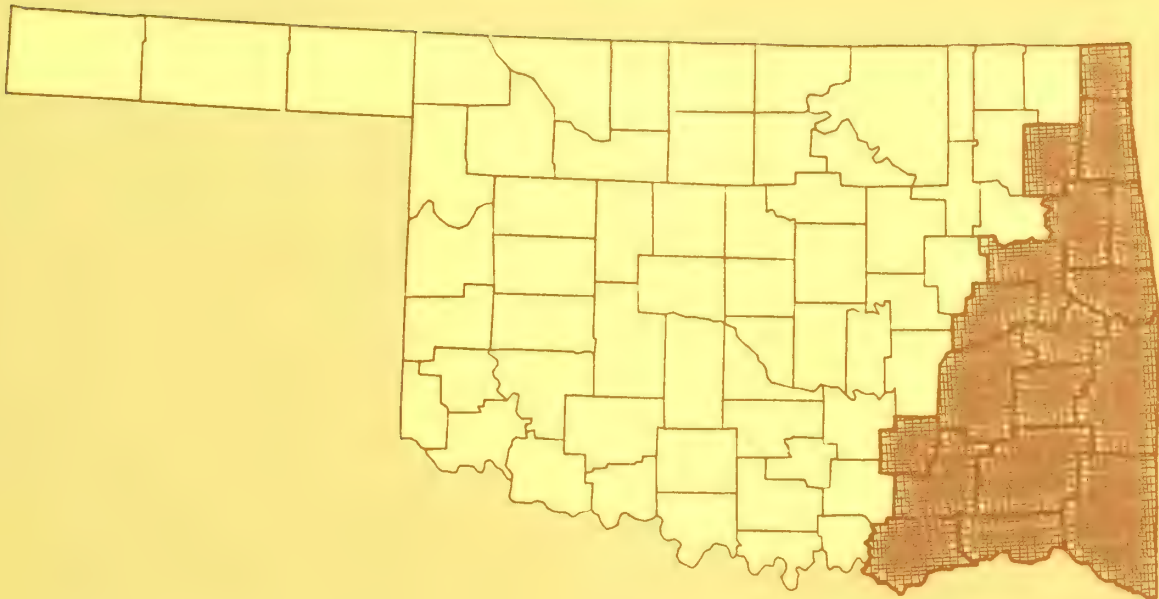
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SO-135



Timber Resources of East Oklahoma

Richard A. Birdsey and Dennis M. May



July 1988

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Timber Resources of East Oklahoma

Richard A. Birdsey and Dennis M. May

HIGHLIGHTS

This report presents the principal findings of the fifth forest survey of east Oklahoma. To make accurate estimates of forest area, 32,817 photo plots were classified and 2,767 field plot locations were visited to verify the photointerpretation. Detailed classifications of timberland are based on measurements and observations at 1,828 permanent sample plot locations. Field work in east Oklahoma was done between January and April, 1986. Some highlights of the survey are listed below.

- Timberland area in east Oklahoma has increased by 10 percent to 4,748 thousand acres, reversal of the 12 percent decline reported between 1966 and 1976.
- Loblolly pine now accounts for 19 percent of all pines in the State, up from 5 percent in 1976.
- The area of pine plantations has increased from 44 thousand acres in 1976 to 264 thousand acres in 1986.
- An additional 173 thousand acres of oak-pine type showed evidence of artificial regeneration.
- Significant shifts occurred in stand-size and age-class distributions, caused by intensive pine harvesting and maturing hardwoods.
- The volume of softwood growing stock has not changed since the last survey.
- The volume of hardwood growing stock increased by 16 percent since the last survey.
- An increase in softwood removals and a decline in softwood growth caused the growth/removals ratio to fall below 1.0.
- The average net annual growth of hardwood growing stock has declined steeply. Removals have risen, so the hardwood growth/removal ratio is close to 1.0.
- Average annual mortality has nearly doubled since the last survey.
- Almost one-third of east Oklahoma's timberland was significantly disturbed since the last survey.
- Despite heavy cutting, most pine stands retained adequate stocking.

- East Oklahoma's timberland is currently producing timber at only 30 percent of maximum potential. More than half of all timberland is less than 60 percent stocked with growing-stock trees.
- Oklahoma's eastern forests supply more than 50 million cubic feet of timber products each year.
- Production of hardwood saw logs and pulpwood has increased relative to softwoods in recent years.

AN OVERVIEW OF EAST OKLAHOMA'S FORESTS

East Oklahoma is partitioned into two broad resource regions for the forest survey (fig. 1). The Southeast region is 55 percent forested and the Northeast region is 39 percent forested (table I). Most forest industry in Oklahoma is located in the Southeast region. The southern portion of this region is part of the West Gulf Coastal Plain (fig. 2). North of the Coastal Plain the Ouachita Mountains and Arkansas Valley and Ridges extend westward from Arkansas (U.S. Department of Agriculture, Soil Conservation Service, 1984). The Southeast region contains most of Oklahoma's pine and oak-pine forests (table II). About 53 percent of the timberland is classified as upland or bottomland hardwood type (Birdsey and Bertelson 1987a). All of the State's National Forest land is located in the Southeast. The proportion of forest cover declines from east to west (fig. 3).

Table I.—Area by land class and forest resource region, east Oklahoma, 1986

Land class	Forest resource region		
	Total	Southeast	Northeast
	<i>Thousand acres</i>		
Timberland	4,747.5	3,481.2	1,266.3
Woodland	485.9	367.9	118.0
Reserved timberland	23.0	23.0	0.0
Nonforest land	4,847.6	2,874.7	1,972.9
All land	10,104.0	6,746.8	3,357.2

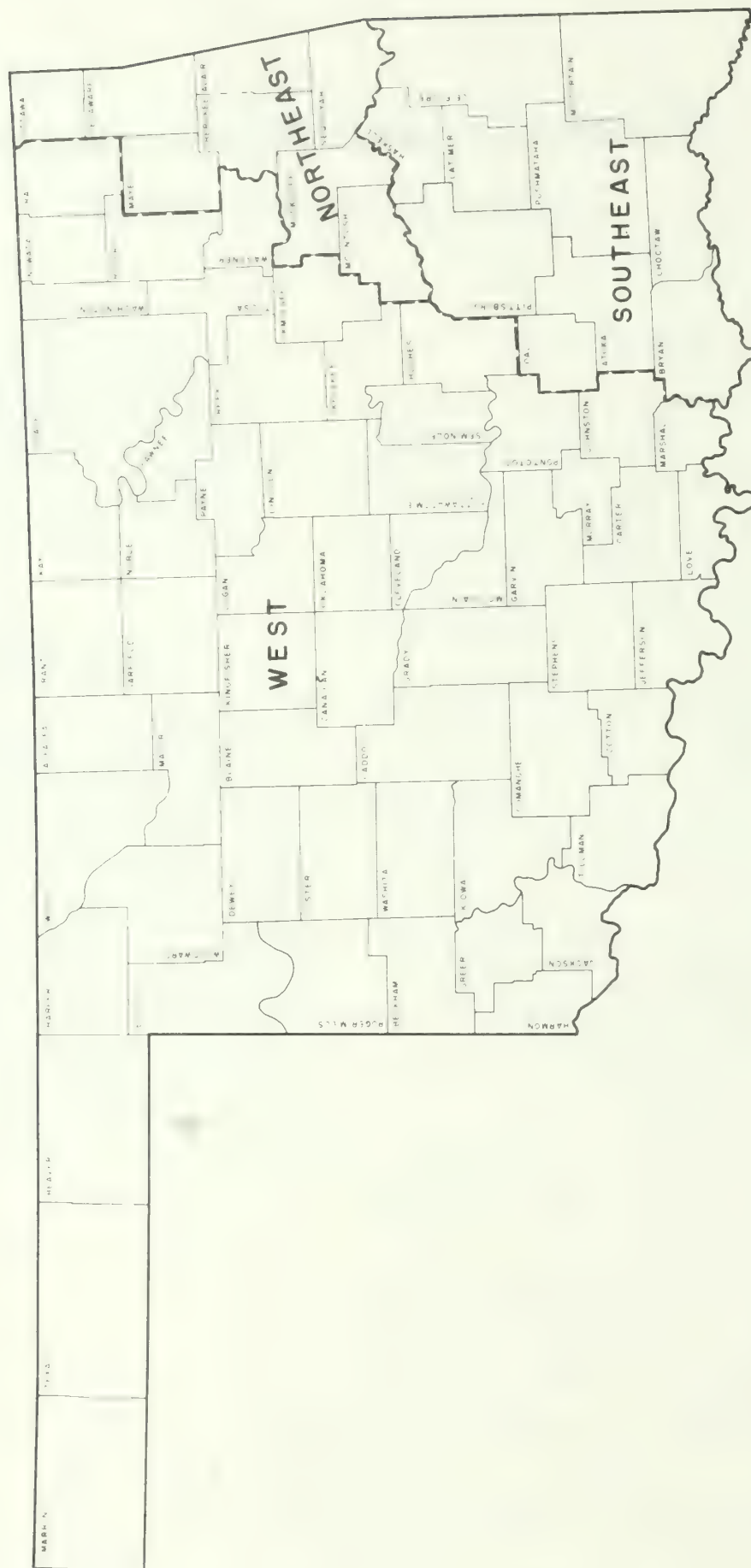


Figure 1.—Forest resource regions of Oklahoma.

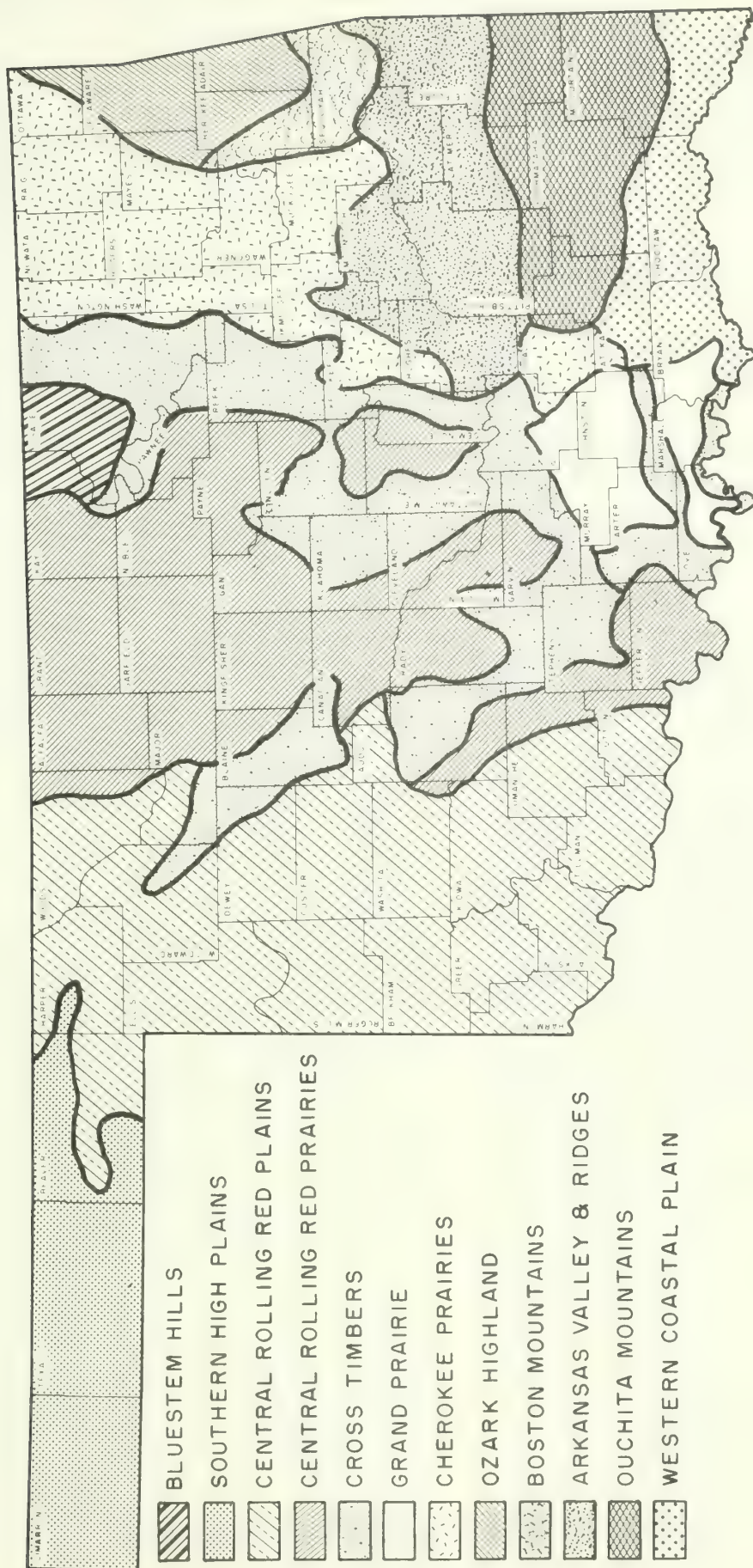


Figure 2.—Major land resource areas of Oklahoma (U.S. Department of Agriculture, Soil Conservation Service 1984).

The eastern portion of the Northeast region is physiographically part of the Ozark Highlands and Boston Mountains that extend westward from Arkansas. The region's remaining area is sparsely-forested prairie. The Northeast region contains mostly oak-hickory forest types owned by farmers and other individuals (Birdsey and Bertelson (1987b).

TIMBER RESOURCE TRENDS IN EAST OKLAHOMA

The forest survey of Oklahoma has traditionally sampled timberland (formerly "commercial forest land") in east Oklahoma. The region includes 18 counties with forests covering an average of 52 percent of the land surface. Of the total 5,256 thousand acres of forest, 4,748 thousand acres are classified as timberland, 486 thousand acres are classified as woodland, and 23 thousand acres are classified as reserved timberland.

Timberland Area

The first forest survey of Oklahoma in 1936 covered five counties in the Southeast: McCurtain, Pushmataha, LeFlore, Latimer, and Haskell. Forest area was 2,961 thousand acres or 74 percent of the total area. Fifteen percent of the forest was classified as old growth. Pine and mixed pine-hardwoods comprised 47 percent of the forest land (Eldredge 1938).

The first complete survey of east Oklahoma in 1956 included 17 counties (U.S. Department of Agriculture, Forest Service 1957). The five counties that were re-surveyed had maintained a forest cover of 2,851 thousand acres. Most of the old-growth pine had been cut and replaced by second-growth pine and mixed pine-hardwood. Total timberland acreage in east Oklahoma in 1956 was 5,184 thousand acres (adjusted to the current productivity threshold for timberland, and including Bryan County, which was first surveyed in 1976).

By 1966, timberland area declined 5 percent to 4,906

Table II.—Area of timberland by forest type and resource region, east Oklahoma, 1986

		Forest resource region	
Forest type	Total	Southeast	Northeast
----- Thousand acres -----			
Loblolly-shortleaf	956.0	939.2	25.8
Oak-pine	757.3	719.2	38.1
Oak-hickory	2,597.1	1487.2	1,109.9
Oak-gum-cypress	358.8	297.9	60.9
Elm-ash-cottonwood	78.4	46.8	31.6
All types	4,747.5	3,481.2	1,266.3

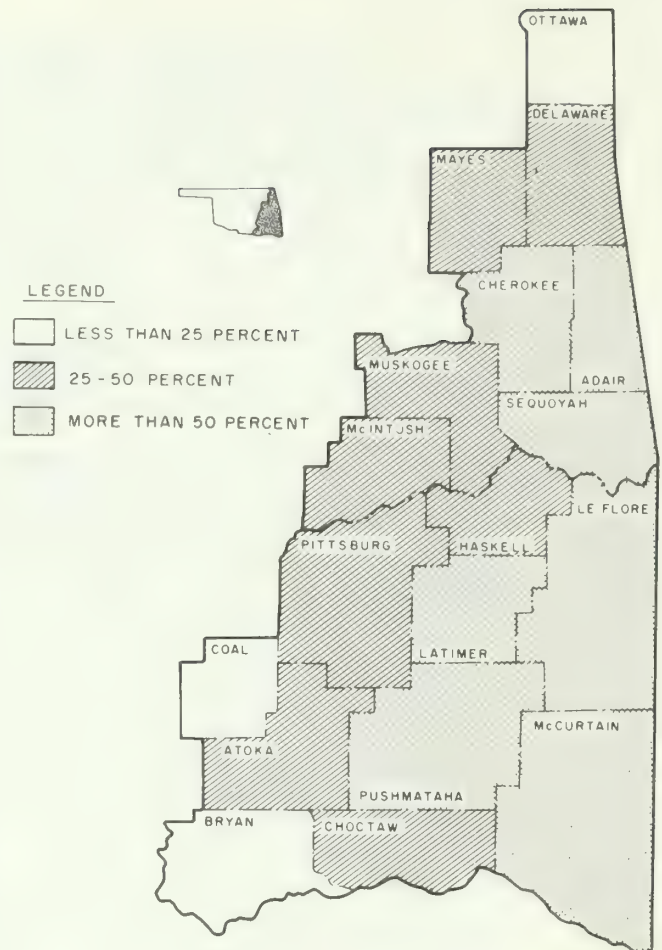


Figure 3.—Proportion of land area in forest, east Oklahoma, 1986.

thousand acres (adjusted to include Bryan County). Between 1956 and 1966, 396 thousand acres of timberland were cleared for agriculture and other uses, while 169 thousand acres reverted to timberland (Sternitzke and Van Sickle 1968).

The decline in timberland acreage intensified between 1966 and 1976. The last survey showed only 4,323 thousand acres of timberland, a 12-percent decline for the 10-year inter-survey period (Murphy 1977). Most of the losses were in the western and northern parts of the region. A total of 660 thousand acres of timberland were cleared for agriculture and other uses, and only 78 thousand acres reverted to timberland.

The current survey reveals a strong reversal of this trend. Timberland area has increased by 10 percent to 4,748 thousand acres. Clearing of timberland totaled only 94 thousand acres between 1976 and 1986 (table III). Reversions of pasture and idle farmland to timberland added 409 thousand acres. Some forest land was reclassified from woodland (formerly called "unproductive forest") to timberland. With the exception of Bryan County, most of the increase in timberland occurred in the easternmost counties (fig. 4).

Resource region	Total area ¹	Timberland	Net Change	Additions from:			Diversions to:		
				Total	Agriculture	Other	Total	Agriculture	Other
<i>Thousand acres</i>									
Southeast	6,988.3	3,481.2	235.1	309.7	293.4	16.3	74.6	20.4	54.2
Northeast	3,569.1	1,266.3	189.0	208.7	115.6	93.1	19.7	14.2	5.5
All regions	10,557.4	4,747.5	424.1	518.4	409.0	109.4	94.3	34.7	59.7

timberland area of about 214 thousand acres. All of the National Forest timberland is located in LeFlore and McCurtain Counties.

The area of timberland owned by farmers has increased by 18 percent since 1976. Most reversions were to the upland hardwood type.

Individual and corporate landowners also increased their timberland holdings. Miscellaneous private individuals comprise the largest and most diverse group of east Oklahoma timberland owners, controlling 38 percent of all timberland.

Species Composition and Forest Type

East Oklahoma's timberland is dominated by hardwoods that comprise, on average, 74 percent of the basal area. In the northeast region, 96 percent of the basal area is in hardwoods, and in the southeast, 66 percent of the basal area is in hardwoods. The most common hardwood species are white oaks, red oaks, hickories, and elms. The most common softwood is shortleaf pine, followed by loblolly pine. Loblolly pine is increasing in importance as pine plantations gradually replace natural pine stands. In 1976, loblolly pines accounted for only 5 percent of all pines. By 1986, loblolly pines accounted for 19 percent of all pines. Most of the decrease in shortleaf pines occurred in the 2-inch size class, while significant increases in numbers of loblolly pines occurred in the 2- through 8-inch classes.

Forest type is based on stocking plurality of individual species or species groups. Pine types, defined as stands with more than 50-percent stocking in pines, have increased from 847 thousand acres in 1976 to 956 thousand acres in 1986. In Oklahoma, the loblolly-shortleaf type is principally composed of the loblolly pine and shortleaf pine associations (table IV). The

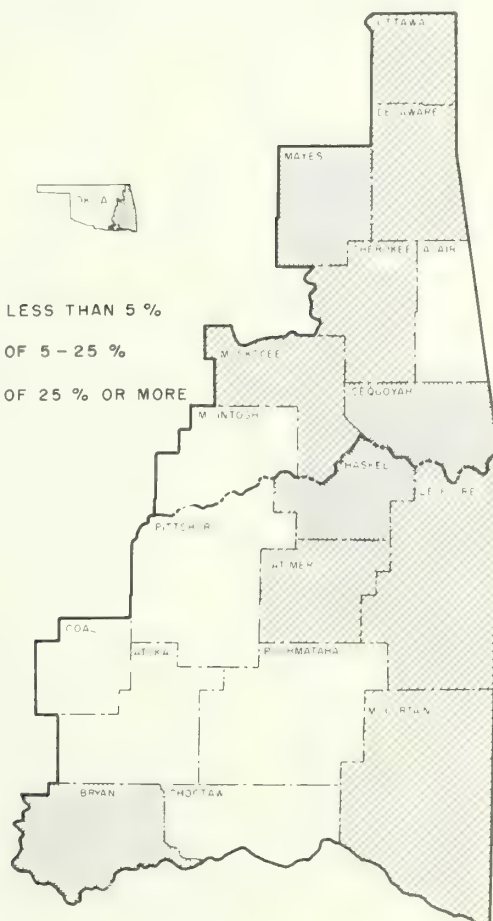


Figure 4.—*Change in timberland area, east Oklahoma, 1976-1986.*

Timberland Ownership

Public owners hold about 12 percent of east Oklahoma's timberland. There has been little change in the area of public timberland over the years. An apparent increase in National Forest timberland is the result of estimating the public forest area from survey sample plots rather than reporting the enumerated areas. The Ouachita National Forest reports an actual

Table IV.—Area of timberland by detailed forest type and stand-size class, east Oklahoma, 1986

Detailed forest type	All classes	Sawtimber	Poletimber	Sapling-seedling	Nonstocked
-----Thousand acres-----					
Loblolly pine	274.6	33.8	51.4	189.4	0.0
Shortleaf pine	675.4	372.1	180.2	123.1	0.0
Shortleaf pine-oak	562.7	215.3	202.3	139.1	6.0
Loblolly pine-hardwood	155.3	5.6	11.3	138.4	0.0
Oak hickory	354.6	35.2	64.5	86.6	168.2
Post oak-black oak	752.1	107.6	348.3	194.1	75.2
Oak-hickory-gums	1,439.9	221.9	651.0	427.4	139.6
Southern scrub oak	46.8	6.2	11.6	6.0	23.0
Oak-gum-cypress	142.0	71.8	23.5	34.9	11.8
Sugarberry-elm-ash	160.2	47.7	62.5	22.9	27.1
Overcup oak-water hickory	38.8	12.0	13.2	0.0	13.6
Sycamore-pecan-elm	49.7	19.2	11.5	19.1	0.0
Other types	122.4	21.2	30.0	59.0	12.1
All types	4,747.5	1,169.6	1,661.3	1,440.0	476.6

shortleaf type accounts for 71 percent of all pine type acreage. When pine types are classified by stand-size class, the shift from shortleaf to loblolly pine becomes evident. For sawtimber and poletimber stand-sizes, shortleaf pine accounts for 87 percent of the pine stands. For sapling and seedling stand-sizes, shortleaf pine accounts for only 39 percent of the pine stands.

The oak-pine types contain 25-50 percent of stocking pines. Oak-pine acreage increased from 693 thousand acres to 757 thousand acres between surveys. Some of the young oak-pine was regenerated artificially and will likely shift to the pine plantation category after a few years. Hardwoods often dominate the stocking in young pine plantations until the pine seedlings attain dominance naturally or as a result of hardwood stocking control. A total of 173 thousand acres of oak-pine type showed evidence of artificial regeneration.

The pine and oak-pine types combined show the location and relative density of east Oklahoma's softwood resource (fig. 5). Nearly all of the softwood is concentrated in four southeastern counties and a surrounding fringe of five counties.

The oak-hickory type contains less than 25-percent stocking of pines. Oak-hickory has increased the most between surveys, from 2,357 to 2,597 thousand acres. The oak-hickory type is composed mainly of the oak-hickory, post oak-black oak, and oak-hickory-gum associations. Some of the oak-hickory, 80 thousand acres, shows evidence of artificial pine regeneration.

The bottomland hardwood types, principally the oak-gum-cypress and sugarberry-American elm-green ash associations, changed little between surveys. The total area in 1986 was about 437 thousand acres.

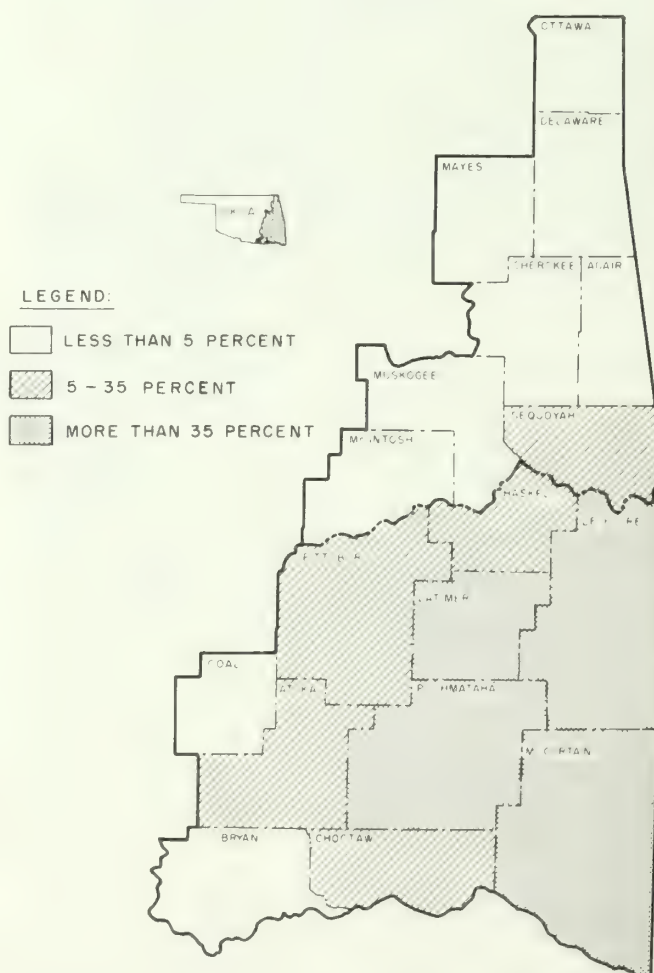


Figure 5.—Proportion of timberland classified as pine or oak-pine forest type, east Oklahoma, 1986.

In summary, the major species shift involves the gradual replacement of shortleaf pine with loblolly pine in intensively-managed pine plantations. For all forest types, the average showing evidence of artificial regeneration jumped from 111 thousand acres in 1976 to 517 thousand acres in 1986.

Stand Structure and Age

Some significant shifts appeared in stand-size class distributions since the last survey. Public timberland has shifted to the larger size classes (fig. 6). Forest industry holdings, well-balanced in 1976, now have more than half of all timberland classified as nonstocked or sampling seedling stand sizes. This shift follows inten-

sive harvesting over the past decade. Timberland held by farmer and miscellaneous private owners showed a significant decrease in the area of sapling-seedling stands, and increases in all other classes. This reflects maturing timber in older stands, and the increase in cropland reversions.

The current age-class distribution tells much the same story (table V). For forest industry owners, 41 percent of all timberland has stands less than 10 years old. Timberland held by other private owners tends to be more evenly distributed among age classes through age 60, although there is a noticeable dip in the 21-30 year age class.

The age-class distribution by forest type and stand origin shows how the pine resource is shifting to planted instead of natural pine (table VI). For pine and oak-pine timberland less than 10 years old, 85 percent of the stands showed evidence of artificial regeneration. The large acreage of hardwood less than 10 years old has resulted from increased reversions and lack of adequate pine regeneration after harvest.

Despite an increasing acreage of young pine stands, the number of 2-inch softwoods has dropped sharply since 1976 (fig. 7). A healthy increase in the 4- and 6-inch classes, plus a good regeneration record (see later discussion), indicates that the effect of the decline in 2-inch softwoods may be negligible by the next survey. But should this trend continue, softwood timber production could decline rapidly. The 8- and 10-inch diameter classes showed declines that are the result of intensive softwood timber harvesting.

The changes in the hardwood diameter distribution show the aging of most hardwood stands (fig. 8). The large acreage of reverting pasture is still poorly stocked and has not yet had time to reverse the trend of declining numbers of small hardwoods.



Figure 6.—Proportion of timberland by stand-size class and survey date, by owner, east Oklahoma, 1986.

Table V.—Area of timberland by age class¹ and owner, east Oklahoma, 1986

Age class	All owners	Public	Forest industry	Other private
----- Thousand acres -----				
0-10	1,221.5	112.0	426.5	683.0
11-20	699.8	72.3	148.4	479.1
21-30	397.6	53.2	76.4	268.0
31-40	688.7	75.3	128.5	484.9
41-50	841.8	109.3	162.5	570.0
51-60	477.9	84.8	51.7	341.4
61-70	166.9	17.3	40.5	109.1
71-80	114.3	29.2	6.0	79.1
81-90	51.0	12.1	0.0	38.9
90+	88.3	19.8	5.6	62.9
All ages	4,747.5	585.3	1,046.0	3,116.2

¹Mixed-age stands were given the average age of the dominant stand-size class.

Table VI.—Area of timberland by age class¹, forest type, and stand origin, east Oklahoma, 1986

Age class	Planted pine	Natural pine	Planted oak-pine	Natural oak-pine	Planted hardwood ²	Natural hardwood
-----Thousand acres-----						
0-10	179.0	23.9	150.4	35.5	80.0	752.7
11-20	73.9	82.9	22.5	91.0	0.0	429.5
21-30	11.3	119.3	0.0	105.5	0.0	161.5
31-40	0.0	215.8	0.0	125.4	0.0	347.5
41-50	0.0	136.3	0.0	100.8	0.0	604.8
51-60	0.0	59.5	0.0	58.3	0.0	360.1
61-70	0.0	36.1	0.0	18.3	0.0	112.5
71-80	0.0	11.6	0.0	24.4	0.0	78.3
81-90	0.0	0.0	0.0	19.3	0.0	31.6
90+	0.0	6.5	0.0	6.0	0.0	75.8
All ages	264.1	691.8	172.9	584.4	80.0	2,954.3

¹Mixed-age stands were given the average age of the dominant stand-size class.

²Most planted hardwood represents pine plantations in which hardwoods comprise more than 75 percent of the stocking.

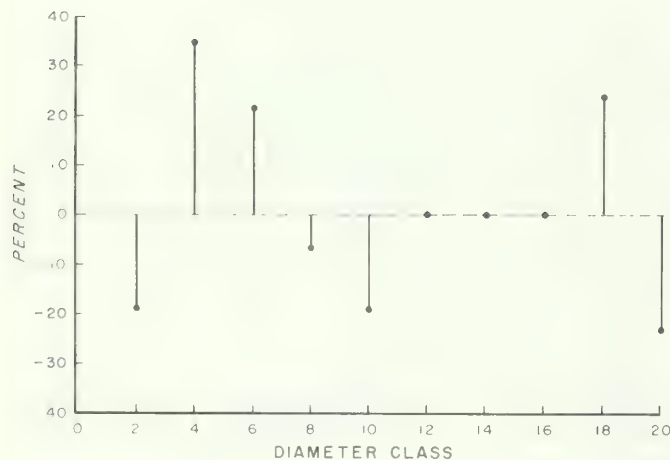


Figure 7.—Change in number of live softwood trees between surveys, east Oklahoma, 1976-1986.

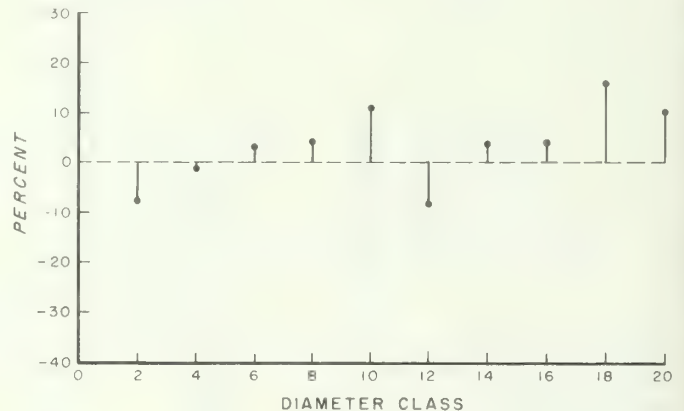


Figure 8.—Change in number of live hardwood trees between surveys, east Oklahoma, 1976-1986.

Timber Volume

East Oklahoma's timberland contains 1.0 billion cubic feet of softwood timber, about the same as reported in 1976. The volume of softwood growing stock in the 6-inch and 12-inch classes has increased, while volume in most other classes has decreased (fig. 9). There has been some shift in volume from shortleaf pine to loblolly pine (fig. 10). Very little change occurred in the distribution of softwood timber volume among timber classes (fig. 11).

Forest industry owned more than half of east Oklahoma's softwood growing stock in 1976, but by 1986 the proportion dropped to 35 percent. Losses in softwood volume by forest industry were offset by gains in the other ownership classes. Of four counties with the most pine and oak-pine timberland, only Latimer

County showed an increase in the volume of softwood growing stock.

The volume of hardwood growing stock increased by 16 percent during the inter-survey period. The increase involved all diameter classes, but was especially pronounced in the 8- and 10-inch pole timber classes (fig. 12). Oaks and hickories gained the most volume (fig. 10). The volume of hardwood growing stock increased in all timber classes (fig. 11).

Among owners, forest industry showed a 26 percent decline in hardwood growing stock, while other private owners showed a 29 percent increase. Other private owners control 71 percent of all hardwood growing stock in east Oklahoma. Much of the hardwood is located in the same four-county area that has most of the softwood growing stock, but some other counties, notably Cherokee and Adair, also contain significant volumes of hardwood growing stock.

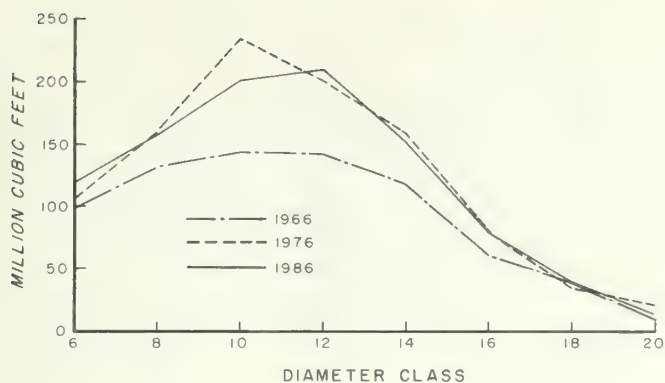


Figure 9.—Volume of softwood growing stock by tree diameter class, east Oklahoma, 1966-1986.

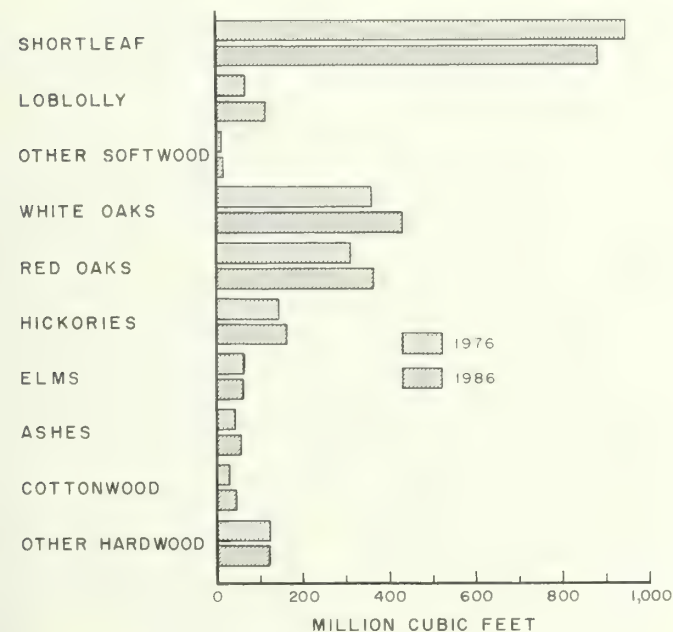


Figure 10.—Volume of growing stock by species, east Oklahoma, 1976 and 1986.

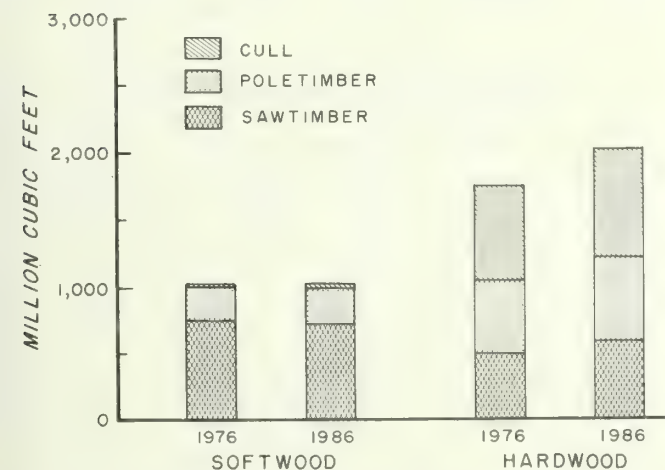


Figure 11.—Volume of growing stock by class of timber, east Oklahoma, 1976 and 1986.

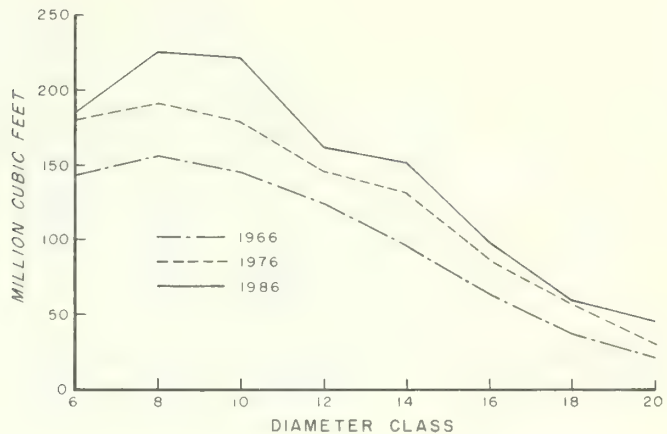


Figure 12.—Volume of hardwood growing stock by tree diameter class, east Oklahoma, 1966-1986.

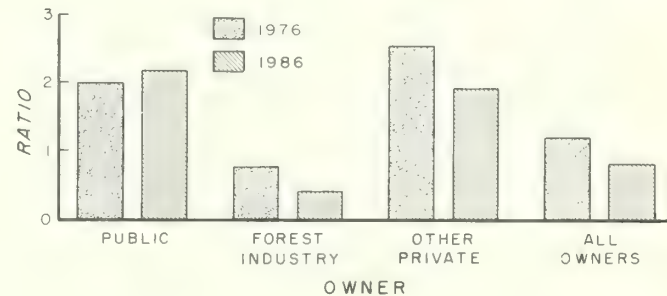


Figure 13.—Ratio of softwood growth to removals by ownership class, east Oklahoma, 1976 and 1986.

Growth, Removals, and Mortality

Average net annual growth of softwood growing stock has declined from 56 to 46 million cubic feet since 1976. Almost all of the decline occurred on forest industry timberland. Other private owners showed a slight increase in average net annual growth.

While net growth was declining, annual softwood removals have increased from 47 to 54 million cubic feet. Most of the increase was on forest industry timberland. Declining net growth and increasing removals of softwood have resulted in an unfavorable growth and drain situation (fig. 13). The softwood growth/removals ratio has dropped below 1.0 for all owners combined, chiefly because of the very low ratio on forest industry timberland.

Although the total volume of softwood growing stock was essentially unchanged between 1976 and 1986, the average rate of change was negative (table (VII)). Growth has been declining and removals increasing over the period. Should these conditions persist, a substantial decline in softwood inventory would be inevitable.

Table VII.—Components of annual change in the volume of growing stock by species group and resource region, east Oklahoma, 1976-1986

Resource region	Species group	Survivor growth	Ingrowth ¹	Growth on removals	Growth on mortality	Cull increment	Mortality	Timberland removals	Landclearing removals	Net change
- Million cubic feet per year -										
Southeast	Softwood	31.6	7.9	8.8	0.8	-0.8	-3.0	-50.5	-1.6	-6.8
	Hardwood	24.6	5.7	3.4	2.4	-4.0	-11.1	-22.4	-2.6	-4.0
	Total	56.2	13.5	12.2	3.3	-4.9	-14.0	-72.9	-4.2	-10.8
Northeast	Softwood	1.4	0.1	0.7	0.0	0.0	-0.1	-3.7	-0.0	-1.6
	Hardwood	17.9	2.5	0.6	0.9	-0.4	-3.6	-2.7	-2.4	12.8
	Total	19.3	2.6	1.3	1.0	-0.3	-3.7	-6.4	-2.4	11.4
East Oklahoma	Softwood	33.0	8.0	9.5	0.8	-0.8	-3.1	-54.2	-1.6	-8.4
	Hardwood	42.5	8.2	4.0	3.3	-4.4	-14.7	-25.1	-5.0	8.8
	Total	75.5	16.1	13.5	4.3	-5.2	-17.7	-79.3	-6.6	0.6

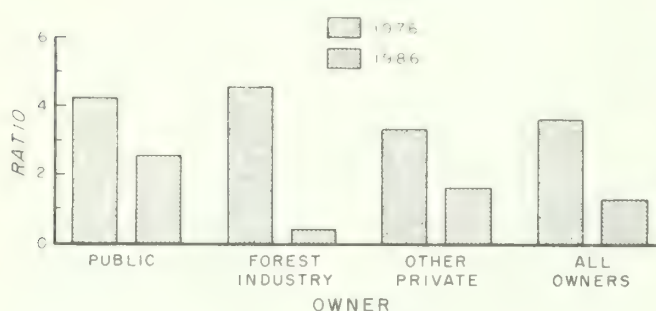
¹Includes ongrowth trees

Figure 14.—Ratio of hardwood growth to removals by ownership class, east Oklahoma, 1976 and 1986.

Average net annual growth of hardwood growing stock has plunged from 61 million cubic feet to 39 million cubic feet. All ownership classes shared some of the decline.

Hardwood removals increased substantially, from an annual rate of 17 million cubic feet in 1976 to 30 million cubic feet in 1986. Declining growth and increasing removals have caused a steep drop in the growth/removal ratio (fig. 14). The ratio declined for all ownership groups, but only forest industry has a ratio below 1.0.

One factor contributing to a declining net annual growth is an increase in mortality. For all species, average annual mortality nearly doubled, from 9 million cubic feet to 17 million cubic feet. The principal causes of mortality were disease and weather.

Net annual growth has also been slowed by an increase in the number of rough and rotten trees, and by an increase in the average of poorly-stocked timber stands. In 1976, 2.1 million acres or 48 percent of all timberland were less than 60 percent stocked with growing-stock trees. By 1986, 2.9 million acres or 60 percent of all timberland were less than 60 percent stocked with growing-stock trees. Most poorly stocked stands are in the hardwood types.

Timberland Disturbance and Regeneration

Almost one-third of east Oklahoma's timberland, excluding additions, was significantly disturbed since the last survey (table VIII). The most common disturbance was partial cutting, followed by clearcuts and other management practices. Clearcuts were most common on forest industry timberland, while partial cutting was the most common disturbance on other private timberland.

The pine and oak-pine types were most likely to be disturbed (table IX). More than half of all pine type timberland was disturbed, and 40 percent of the oak-pine timberland was disturbed. Clearcutting was most often practiced in pine and oak-pine timberland. Partial cutting affected all types, but affected the most acreage in the upland hardwood type group.

Despite heavy cutting, most pine stands retained adequate stocking (table X). About three-fourths of all harvested pine stands were in the highest pine stocking class. Forest industry owners were a little more successful in regenerating pine than other private owners. Most hardwood stands were not regenerated to pine. Those that were planted with pine roughly offset the pine stands that were not adequately regenerated.

TIMBER MANAGEMENT OPPORTUNITIES FOR EAST OKLAHOMA

East Oklahoma's timberland is currently producing timber at only 30 percent of maximum potential (table XI). Most timberland fails to achieve full growth potential for two reasons: poor stocking, and a high proportion of cull tree stocking. To some extent these conditions are inherent to Oklahoma's timberland because of the prevalence of low-productivity sites, especially north and west of the coastal plain counties. In addition, standards used by the forest survey to measure stocking adequacy may not be appropriate for timberland in the northern and western counties of east Oklahoma because the standards are based on average stand conditions across the South.

Table VIII.—Area of timberland by disturbance class and ownership class, east Oklahoma, 1986

Disturbance class	All owners	Public	Forest industry	Other private
----- Thousand acres -----				
No disturbance	2,862.3	342.4	452.4	2,067.4
Clearcut	456.4	36.4	374.0	46.0
Partial cut	660.7	55.3	123.2	482.2
Other management	171.8	48.3	79.5	44.0
Natural disturbance	74.5	6.6	11.3	56.7
Additions to timberland	521.8	96.3	5.6	419.9
All classes	4,747.5	585.3	1,046.0	3,116.2

Table IX.—Area of timberland by disturbance class and past forest type, east Oklahoma, 1986

Disturbance class	All types	Pine	Oak-pine	Upland hardwood	Bottomland hardwood
----- Thousand acres -----					
No disturbance	2,862.3	436.4	431.3	1,688.0	306.4
Clearcut	456.4	206.6	151.6	82.0	16.4
Partial cut	660.7	175.9	90.5	307.5	86.8
Other management	171.8	57.9	40.6	67.4	6.0
Natural disturbance	74.5	5.6	0.0	63.3	5.6
All classes ¹	4,225.7	882.4	714.0	2,208.2	421.0

¹Excluding reversions

Table X.—Area of timberland harvested¹ by ownership class, past forest type, and pine-stocking class², east Oklahoma, 1976-1986

Ownership class and past forest type	All classes	Pine stocking class		
		Low	Meduim	High
----- <i>Thousand acres</i> -----				
Public				
Pine types	35.7	6.0	12.0	17.7
Oak-pine	25.0	6.0	6.0	12.9
Hardwood types	31.0	19.4	6.0	5.6
Total	91.7	31.4	24.0	36.2
Forest industry				
Pine types	254.4	22.5	29.2	202.7
Oak-pine	150.4	28.6	58.4	63.4
Hardwood types	92.4	28.9	34.6	28.9
Total	497.2	80.0	122.2	295.0
Other private				
Pine types	92.4	18.2	12.0	62.2
Oak-pine	66.7	36.7	30.0	0.0
Hardwood types	369.1	356.5	12.6	0.0
Total	528.2	378.9	54.6	62.2
All owners				
Pine types	382.5	46.7	53.2	282.6
Oak-pine	242.1	71.3	94.4	76.3
Hardwood types	492.5	404.8	53.2	34.5
Total	1,117.1	522.8	200.8	393.4

¹Includes clearcuts and partial cuts.

²Low indicates 0-30 percent stocked pine. Medium indicates 30-60 percent stocked with pine. High indicates 60+ percent stocked with pine.

Table XI.—Periodic annual net growth and potential productivity¹ of timberland by resource region, east Oklahoma, 1976-1986

Resource region	Potential productivity	Net growth	Growth as percent of potential
- Cubic feet per acre per year - -			Percent
Southeast	62.7	18.6	30
Northeast	52.1	15.6	30
East Oklahoma	60.1	17.8	30

¹Based on site class.

As mentioned earlier, 60 percent of all timberland has less than 60 percent stocking of growing-stock trees, the minimum threshold for adequate stocking. Furthermore, 76 percent of all timberland has more than 30 percent stocking of rough and rotten trees. The situation is much worse for hardwoods than for softwoods: 11 percent of all softwood basal area is classified as rough or rotten, while 57 percent of all hardwood basal area is in rough and rotten trees.

Management opportunities for east Oklahoma pine timberland were computed from data on stocking of growing-stock trees, stocking of cull trees, stand-size class, timber volume, presence of damaged and offsite trees, and presence of inhibiting vegetation. Key stocking thresholds are 60 percent for adequate stocking with growing-stock trees, and 30 percent for significant competition from cull trees.

TIMBER RESOURCE OUTLOOK

Most pine plantations are in relatively good shape and require no treatment (table XII). The most common prescriptions would be control of competing vegetation, followed by regeneration of some poorly-stocked stands. Natural pine stands are in similar condition on the average, except that harvest would be recommended for those stands carrying high volume.

The mixed pine-hardwoods tend to be poorly stocked or stocked with cull trees. Only 28 percent of the mixed stands fell in the "no treatment" category. Most of the 351 thousand acres with a regeneration treatment opportunity actually have between 30 and 60 percent stocking of growing-stock trees. Crop tree release might be more appropriate for marginally-stocked oak-pine and there would be a high probability that these stands would attain full stocking over time (Birdsey and Pitcher 1986).

If the criteria for pine management opportunities were used for hardwoods, most stands would require regeneration or stocking control because of the low average stand density and high site occupancy by rough and rotten trees. About 65 percent of all hardwood stands is poorly stocked, and another 23 percent has significant competition from cull trees. But full stocking according to forest survey standards may be an unrealistic expectation. Furthermore, individual trees tend to have poorer form with low stocking. It might be more realistic to manage the current hardwood forests for products other than the traditional saw log.

Because of the uncertainty about the applicability of management opportunity criteria, no specific recommendations for east Oklahoma's hardwoods will be made in this report. Nevertheless, it is extremely important to note that nearly 1.3 million acres have hardwood stands less than 20 years old. Although these stands have high cull tree occupancy, the average tree has not yet reached a large size. There may now be some excellent opportunities to control stand composition, both species and quality, at an early age.

East Oklahoma's increasing timberland base sends a strong signal that forestry will continue to be important. Timberland shifts since 1966 have mostly involved hardwood types. The pine region has been less volatile but there are prospects for large acreage shifts among owners as forest industries restructure their timberland holdings. Little permanent clearing of pine timberland has been made, most pine harvests are followed by adequate regeneration.

Due to very heavy cutting in recent years, coupled with currently low growth rates, the volume of softwood growing stock is expected to decline slightly. Removals will fall off rapidly, however, as few pine stands with harvest opportunities still remain. After a short-lived decline, volume and growth should increase rapidly as the current large area of young pine plantations reaches the merchantability threshold. An increasingly rapid shift from natural shortleaf pine to plantation-grown loblolly pine is also expected.

The hardwood outlook is both less stable and less optimistic. Land-use shifts are difficult to predict, but the current agricultural crisis largely precludes significant land clearing for crops in the near future.

Recent declines in the numbers of small hardwood trees, and increases in the larger size classes, indicate that much of the hardwood resource is maturing. Declining volumes in smaller trees will counteract increases in the larger trees. Removals will not likely go up much because so much of the timberland is poorly stocked or stocked with poor-quality trees. The current balance between growth and removals will probably be maintained for some time; thus, volume should stabilize at current levels.

At some point, the large acreage of hardwoods less than 20 years old will become a significant factor. Growth and volume will then increase rapidly as these young stands begin to contain merchantable-size timber.

Table XII.—Area of timberland by management opportunity class for pine forest types, east Oklahoma, 1986

Management opportunity class	All pine types	Forest type		
		Planted pine	Natural pine	Oak pine
----- Thousand acres -----				
Regeneration	472.8	28.6	93.6	350.6
Conversion	23.0	11.7	0.0	11.3
Poletimber thinning	23.6	5.6	18.0	0.0
Other stocking control	310.2	34.6	99.9	175.7
Harvest	46.8	0.0	41.2	5.6
Salvage	18.2	0.0	18.2	0.0
No treatment	818.7	183.7	421.0	214.0
All classes	1,713.2	264.1	691.8	757.3

TIMBER PRODUCTS OUTPUT

Oklahoma's eastern forests supply more than 50 million cubic feet of timber products per year to the forest products industry. Although most of the timber product output is comprised of softwoods, the proportion of softwoods to the total output has been declining, falling from 80 percent in 1975 to 75 percent in 1984. Almost all of the softwood harvest originates from the southeastern counties of the State, while the hardwood harvest is distributed among the eastern counties of the State. Saw logs and pulpwood are by far the most common products harvested from Oklahoma's eastern forests, accounting for more than three-quarters of the annual harvest. Veneer logs, poles, posts, and miscellaneous products make up the remainder of the annual harvest.

Saw Logs

Oklahoma's saw-log production has stabilized at an annual rate of about 31 million cubic feet (fig. 15). Although the majority of the saw-log harvest is comprised of softwoods, hardwood saw-logs have been gaining favor. Between 1975 and 1984, the proportion of the total saw-log harvest represented by softwoods fell from 82 percent to 71 percent. Shortleaf pine is the predominant softwood species harvested, and the oaks account for the majority of the hardwood harvest. Most of Oklahoma's saw-log production is processed into lumber within the State. A few large mills process more than 85 percent of all saw-log receipts. These large mills process mostly pine saw-logs, while the

smaller sawmills mainly process hardwoods. However, the proportion of hardwoods being processed by large sawmills has been increasing, climbing from 8 percent of total saw-log receipts in 1975 to 22 percent in 1984.

Pulpwood

Only a small number of pulpmills draw roundwood from Oklahoma's eastern forests. Consequently, any changes in the pulpwood consumption rate of one or more of these mills (caused by pulping capacity increases, market conditions, labor relations, etc.) will have a major impact upon the yearly production of pulpwood from Oklahoma, as depicted in figure 16. Although the State's pulpwood production has fluctuated over the survey period, on the whole, pulpwood production increased by 65 percent between 1975 and 1985. Another and probably more significant trend has been the increasing importance of hardwoods in meeting the demand for pulping fiber. Between 1975 and 1985, the proportion of hardwood furnish to the total pulpwood production almost doubled, increasing from 16 percent to 29 percent, while the actual volume of hardwood furnish tripled.

Other Products

Oklahoma's production of veneer logs has experienced a general downward trend. Between 1975 and 1984, veneer-log production fell by 18 percent (fig. 15). Almost all of the veneer log production is comprised of softwoods, with minor amounts of hardwood, mostly

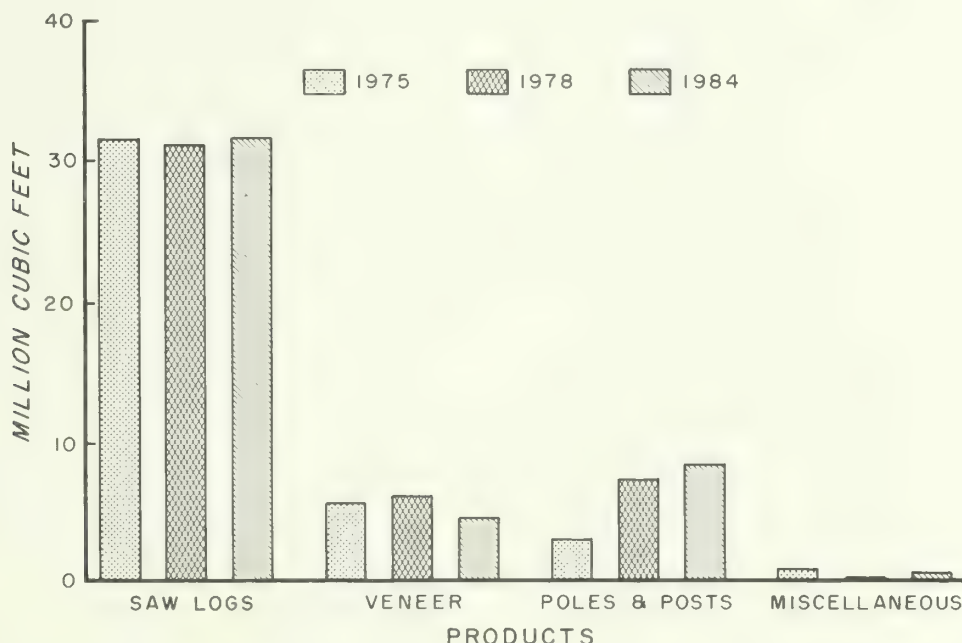


Figure 15.—Roundwood production by product, east Oklahoma, 1975-1984.

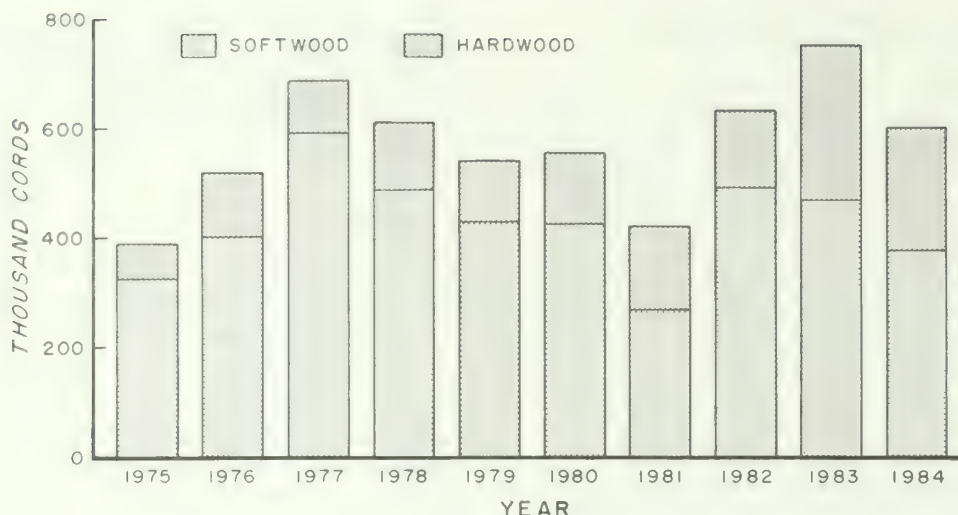


Figure 16.—Pulpwood production, east Oklahoma, 1975-1984.

pecan and walnut, shipped out of state for processing. In contrast to the drop in veneer-log production, pole and post production between 1975 and 1984 tripled (fig. 15). In the same time period, the amount of the pole and post harvest retained and processed within the State increased sixfold. All of the pole and most of the post production is comprised of softwoods. The output of miscellaneous products, such as furniture and handle stock, charcoal wood, and excelsior bolts, has been a relatively minor component of Oklahoma's timber harvest, representing about 1 percent of the total timber product output (fig. 15).

Wood Residues

In converting roundwood into primary products, Oklahoma's forest industries have been generating increasing quantities of wood residues. Between 1975 and 1984, wood residue generation increased 68 percent from 28 to 47 million cubic feet. This is due in part to: advances in technology (chip-n-saws, merchandisers, and onsite chippers), increasing acceptance of wood residues as a source of pulping fiber, and inconsistent responses to the annual pulpwood production surveys. Coarse residues such as slabs, edgings, and cull pieces comprise more than three-quarters of the total wood residue production. Fine residues such as sawdust and shavings make up the remainder. Approximately 95 percent of all wood residues are converted into byproducts. The majority of coarse residues are converted into pulping fiber, while the majority of fine residues are utilized as fuel. In addition, 90 percent of the bark generated by Oklahoma's primary forest industries is also burned as fuel.

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APPENDIX

Survey Methods

Forest resource statistics were obtained by a sampling method employing a forest-nonforest classification on aerial photography and on-the-ground measurements of trees at sample locations. Inventory volume and area statistics are required to give precise answers at the State level to one standard deviation of the total, equal to 1 percent per million acres of forest land and to 5 percent per billion cubic feet. The estimate of timberland acreage is based on the photointerpretation of recent aerial photography using dot counts on specific plot locations as to a forest or nonforest classification. These dot counts yield the proportion of forest to nonforest areas in each county. Forest area changes are then determined from field observations of permanent 3- by 3-mile grid (measurement plots) locations. Additional plots (intensification plots), for classifying points as to forest or nonforest condition only, are used further to reduce the sampling error for forest area. The field classifications of these two types of plots (3x3 and intensification) are used to correct photointerpretation errors and adjust the county timberland acreage estimate that comes from the dot counts associated with each plot location in the county. The intensity level of the 3- by 3-mile grid layout of permanent measurement plots gives each sample plot an expansion factor representing, on average, 5,760 acres per plot.

Volume estimates come entirely from the 3- by 3-mile grid permanent sample plots and measurements of individual trees on these plots. The plots established by the prior survey were remeasured to determine the elements of change. In Oklahoma, 10 points were measured at each plot location. Trees 5.0 inches in diameter and larger were selected with a 37.5 factor prism, thus each tree selected with the prism represented 3.75 square feet of basal area. Trees smaller than 5.0 inches in diameter were tallied on a 1/275 acre circular plot fixed around the first 3 points of the 10-point cluster.

Forest survey uses a satellite point system with a large factor prism to get a representative sample of stand conditions at each plot location. This eliminates the effect that vegetation clumping and open gaps would induce if only one point or one fixed plot were used at each plot location.

Volumes in Oklahoma were derived from deterministic measurements of trees on all sample locations. These deterministic measurements include diameter at breast height, total height, bole length, log length, and four upper stem diameters. Volumes for these trees were computed using Smalian's formula. Volume equations were developed for seven species groups and these equations were used to estimate volumes at time of removal or death for trees that did not survive the remeasurement period, and to estimate the past volume for nongrowth trees (see definitions). Procedures for estimating growth are documented elsewhere (May 1988).

Reliability of the Data

A relative standard of accuracy has been incorporated into the forest survey. This satisfies user demands, eliminates as much as possible any elements of error—either human or from instrumentation—and permits the control of costs within prescribed economic limits.

The first type of error, estimating error, involves three basic areas: (1) biased error, caused by instruments not properly calibrated, (2) compensating error, caused by instruments of moderate precision and (3) accidental error, caused by human error in measuring and compiling. All of these are held to a minimum by a system that incorporates training, check plots, and an edit (consistency) check. Field personnel undergo training for 3 to 4 months under the guidance of field-experienced personnel. Field work is checked by supervisors. In Oklahoma 4 percent of the plots were field checked for errors. Editing checks in the office screen out logical and data entry errors on all plots. It is not possible to evaluate estimating error statistically but

Table XIII.—*Sampling errors for estimates of total timberland area, volume, net annual growth (1976-1986), and annual removals (1976-1986), east Oklahoma.*

Item	Total	Unit	Percent sampling error
Timberland area	4,747.5	Thousand acres	0.7
Growing stock			
Volume	2,219.1	Million cubic feet	4.3
Net annual growth	84.4	Million cubic feet	5.2
Annual removal	83.9	Million cubic feet	7.2
Sawtimber			
Volume	6,688.5	Million cubic feet	5.5
Net annual growth	311.4	Million cubic feet	7.7
Annual removals	285.7	Million cubic feet	8.6

Table XIV.—*Sampling error to which estimates are liable, 2 chances out of 3, east Oklahoma, 1986*

Sampling error ¹	Timberland area	Growing stock			Sawtimber		
		Volume	Net	Annual removals	Volume	Net	Annual removals
			annual growth			annual growth	
<i>Percent</i>	<i>Thousand acres</i>	<i>- - - Million cubic feet - - -</i>			<i>- - - Million board feet ² - - -</i>		
1.0	2,326.3	...	...	...	...	...	...
2.0	581.6	...	...	...	...	...	...
3.0	258.5	...	...	...	...	...	...
4.0	145.4	...	...	...	...	...	...
5.0	93.1	1,641.2	...	...	...	...	...
10.0	23.3	410.3	22.8	43.5	2,023.3	184.6	211.3
15.0	10.3	182.4	10.1	19.3	899.2	82.1	93.9
20.0	5.8	106.2	5.7	10.9	505.8	46.2	52.8
25.0	3.7	65.6	3.6	7.0	323.7	29.5	33.8

¹By random sampling formula.²International 1/4-inch rule.

the Forest Inventory and Analysis Unit holds it to a minimum by adequate training, experienced supervision, and emphasis on careful work.

The second type of error, sampling error, is the error associated with natural and expected deviation of the sample mean from the true population mean. Thus, the deviation is susceptible to a mathematical evaluation of the probability of error. Sampling errors for State totals are based on one standard deviation (table XIII). That is, the chances are 2 out of 3 that if the results of a 100 percent census were known the sample results would be within the limits indicated.

Estimates smaller than State totals will have resultant larger sampling errors. The smaller the area examined, the larger the sampling error. In addition, as area or volume totals are stratified by forest type, species, diameter class, ownership, or other subunits, the sampling error increases and is greatest for the smallest divisions. The magnitude of this increase is depicted in table XIV and shows the sampling error to which the estimates are liable, 2 chances out of 3.

Definition of Terms

Forest Land Classes

Forest Land—Land at least 16.7 percent stocked by forest trees of any size, or formerly having such tree cover, and not currently developed for nonforest uses. Minimum area considered for classification is 1 acre. Forest land is divided into commercial categories: timberland, deferred timberland; and noncommercial categories: productive-reserved forest land, unproductive forest land.

Timberland—Forest land that is producing, or is capable of producing, crops of industrial wood and not withdrawn from timber utilization. Timberland is synonymous with "commercial forest land" in prior reports.

Deferred Timberland—National forest land that meets productivity standards for timberland but is under study for possible inclusion in the wilderness system.

Productive-Reserved Forest Land—Productive public forest land withdrawn from timber utilization through statute or administrative regulations.

Unproductive Forest Land—Forest land incapable of yielding crops of industrial wood because of adverse site conditions.

Tree Classes

Commercial Species—Tree species currently or prospectively suitable for industrial wood products. Excluded are noncommercial species. See species list.

Noncommercial Species—Tree species of typical small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products. See species list.

Growing Stock Trees—Live trees of commercial species classified as sawtimber, poletimber, sapling, and seedlings. Trees must have a 12-foot butt log now or prospectively to be classed as growing stock.

Rough Trees—Live trees of commercial species that are unmerchantable for saw logs currently or potentially because of roughness or poor form in the butt log. Also included are all live trees of noncommercial species.

Rotten Trees—Live trees of commercial species that are unmerchantable for saw logs currently or potentially because of rot deduction in the butt log.

Cull Trees—Rough or rotten trees.

Hardwoods—Dicotyledonous trees, usually broad-leaved and deciduous.

Softwoods—Coniferous trees, usually evergreen, having needle or scalelike leaves.

Live Trees—All trees alive. Included are all size classes and all tree classes.

Salvable Dead Trees—Standing or down dead trees that were formerly growing stock and are considered merchantable.

Forest Types

Longleaf-Slash Pine—Forests in which longleaf or slash pine, singly or in combination, comprise a plurality of the stocking. Common associates include other southern pines, oak, and gum.

Loblolly-Shortleaf Pine—Forests in which pine and eastern redcedar (except longleaf or slash pine), singly or in combination, comprise a plurality of the stocking. Common associates include oak, hickory, and gum.

Oak-Pine—Forests in which hardwoods (usually upland oaks) comprise a plurality of the stocking, but in which softwoods, except cypress, comprise 25-49 percent of the stocking. Common associates include gum, hickory, and yellow-poplar.

Oak-Hickory—Forests in which upland oaks or hickory, singly or in combination, comprise a plurality of the stocking except where pines comprise 25-50 percent, in which case the stand would be classified oak-pine. Common associates include yellow-poplar, elm, maple, and black walnut.

Oak-Gum-Cypress—Bottomland forests in which tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination, comprise a plurality of the stocking except where pines comprise 25-50 percent, in which case the stand would be classified oak-pine. Common associates include cottonwood, willow, ash, elm, hackberry, and maple.

Elm-Ash-Cottonwood—Forest in which elm, ash, cottonwood, singly or in combination comprise a plurality of the stocking. Common associates include willow, sycamore, beech, and maple.

Nontyped—Timberland currently unoccupied with any live trees or seedlings, e.g., very recent clearcut areas.

Dimension Classes of Trees

Sawtimber Trees—Trees 9.0 inches and larger in d.b.h. for softwoods and 11.0 inches and larger for hardwoods.

Poletimber Trees—Trees 5.0 inches to 8.9 inches in d.b.h. for softwoods and 5.0 to 10.9 inches d.b.h. for hardwoods.

Saplings—Trees 1.0 inch to 4.9 inches in d.b.h.

Seedlings—Trees which are less than 1.0 inch in d.b.h.

Rough, Rotten, and Salvable Dead Trees—See "tree classes."

Stand-Size Classes

Sawtimber Stands—Stands at least 16.7 percent stocked with growing-stock trees, half or more of this stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber Stands—Stands at least 16.7 percent stocked with growing-stock trees, half or more of this stocking in sawtimber or poletimber trees, and with poletimber trees, and with poletimber stocking exceeding that of sawtimber stocking.

Sapling-Seedling Stands—Stands at least 16.7 percent stocked with growing-stock trees, more than half of this stocking in saplings or seedlings.

Nonstocked Stands—Stands less than 16.7 percent stocked with growing-stock trees.

Stocking

Stocking is a measure of the extent to which the growth potential of the site is utilized by trees or preempted by vegetation cover. Stocking is determined by comparing the stand density in terms of number of trees or basal area with a specified standard. Therefore, full stocking is 100 percent of the stocking standard.

Defined below are arbitrarily defined stocking categories.

Understocked—Stands 0 to 60 percent stocked.

Optimally stocked—Stands 60 to 100 percent stocked.

Overstocked—Stands greater than 100 percent stocked.

The tabulation below shows the density standard in terms of trees per acre, by size class, required for full stocking.

D.b.h. (inches)	Number of trees	D.b.h. (inches)	Number of trees
Seedlings	600	16	72
2	560	18	60
4	460	20	51
6	340	22	42
8	240	24	36
10	155	26	31
12	115	28	27
14	90	30	24

Volume

Volume of Cull—The volume of sound wood in the bole of rough and rotten trees.

Volume of Growing Stock—Volume of sound wood in

the bole of sawtimber and poletimber trees from a 1-foot stump to a minimum 4.0-inch top outside bark or to the point where the central stem breaks into limbs. Rough, rotten, and noncommercial trees are excluded.

Volume of Sawtimber—Net volume of the saw-log portion of live sawtimber trees in board feet of the International rule (1/4-inch kerf). Net volume equals gross volume less deductions for rot, sweep, and other defects that affect use for lumber to the point where the central stem breaks into limbs. Rough, rotten, and noncommercial trees are excluded.

Volume of Timber—The volume of sound wood in the bole of growing stock, rough, rotten, and salvable dead trees 5.0 inches and larger in d.b.h. from stump to a minimum 4.0-inch top outside bark, or to the point where the central stem breaks into limbs.

Growth Classes

Gross Growth—Total increase in stand volume computed on growing-stock trees. Gross growth equals survivor growth plus ingrowth plus growth on removals plus growth on mortality plus cull increment.

Net Growth—Increase in stand volume, computed on growing-stock trees. Net growth is equal to gross growth minus mortality.

Net Change—Increase or decrease in stand volume, computed on growing-stock trees. Net change is equal to net growth minus removals.

Classes of Trees Used in Growth Computations

Survivor Trees—Merchantable-and-in at time 1 (previous inventory) and time 2 (current inventory).

Ingrowth Trees—Submerchantable-and-in at time 1 and merchantable-and-in at time 2.

Ongrowth Trees—Submerchantable-and-out at time 1 and merchantable-and-in at time 2; included with ingrowth component for growth computation.

Nongrowth Trees—Merchantable-and-out at time 1 and merchantable-and-in at time 2; included with survivor growth for growth computation.

Removal Trees—Merchantable-and-in at time 1 and removed prior to time 2.

Mortality Trees—Merchantable-and-in at time 1 and dead prior to time 2.

Ownership Classes

National Forest Land—Federal lands which have been legally designated as National Forests or purchase units, and other lands under the administration of the Forest Service, including experimental areas.

Other Federal Land—Federal lands other than National Forests; lands administered by the Bureau of Land Management and Indian Lands.

State, County, and Municipal Lands—Lands owned by the States, counties, and local public agencies or

municipalities, or lands leased to these governmental units for 50 years or more.

Forest Industry Land—Lands owned by companies or individuals operating wood-using plants (either primary or secondary).

Farmer Owned Land—Lands operated as a unit of 10 acres or more from which the sale of agricultural products total \$1,000 or more annually.

Nonindustrial Private Land-Individual—Lands privately owned by individuals other than forest industry, farmer owned, or miscellaneous private corporations.

Nonindustrial Private Land-Corporate—Lands privately owned by private corporations other than forest industry and incorporated farms.

Miscellaneous Definitions

Agricultural Land—Agricultural land is land used primarily for the production of crops or livestock.

Basal Area—The area in square feet of the cross section at breast height of a single tree or of all trees in a stand, usually expressed in square feet per acre.

Cull Increment—The net volume in growing-stock trees that change tree class during a specified period.

D.b.h. (Diameter at breast height)—Tree diameter in inches, outside bark, measured at 4 1/2 feet above ground.

Diameter Classes—The 2-inch diameter classes extend from 1.0 inch below to 0.9 inches above the stated midpoint. Thus, 12-inch class included trees 11.0 inches through 12.9 inches d.b.h.

Log Grades—A classification of logs based on external characteristics as indicators of quality or value.

Mortality—Number or sound-wood volume of live trees dying from natural causes during a specified period.

Plantations—Stands evidenced by regeneration from planting or seeding. Forest Survey categorizes plantations by forest type based upon plot tally.

Saw-Log Portion—That part of the bole of a sawtimber tree between a 1-foot stump and the saw-log top.

Saw-Log Top—The point on the bole of a sawtimber tree above which a saw log cannot be produced. The minimum saw-log top is 7.0 inches diameter outside bark (d.o.b.) for softwoods and 9.0 inches d.o.b. for hardwoods.

Site Classes—A classification of forest land in terms of potential capacity to grow crops of industrial wood.

Timber Removals—The net volume of growing-stock trees removed from the inventory by harvesting or cultural operations such as timber-stand improvement, land clearing, or change in land use.

Tree Grade—The grade assigned to the entire log length of a sawtimber tree, which is based upon the grade of the butt-log portion (the first 16 feet) only. In

past surveys, a log grade was assigned to each upper log based upon log grade standards.

Upper-stem Portion—That part of the main stem or fork of a sawtimber tree above the saw-log top to a diameter outside bark of 4.0 inches to the point where the main stem or fork breaks into limbs.

Species List

Scientific and common names of tree species sampled in Oklahoma¹.

Commercial Species

Genus	Species	Common Name
Softwoods		
<i>Juniperus</i>	<i>virginiana</i>	eastern redcedar
<i>Pinus</i>	<i>echinata</i>	shortleaf pine
	<i>taeda</i>	loblolly pine
<i>Taxodium</i>	<i>distichum</i> var.	
	<i>distichum</i>	baldcypress

Hardwoods

Genus	Species	Common Name
<i>Acer</i>	<i>barbatum</i>	Florida maple
	<i>negundo</i>	boxelder
	<i>rubrum</i> var.	
	<i>rubrum</i>	red maple
	<i>saccharinum</i>	silver maple
<i>Betula</i>	<i>saccharum</i>	sugar maple
	<i>nigra</i>	river birch
	sp.	hickory
	<i>aquatica</i>	water hickory
	<i>illinoensis</i>	pecan
<i>Celtis</i>	<i>laevigata</i>	sugarberry
	<i>occidentalis</i>	hackberry
<i>Cornus</i>	<i>florida</i>	flowering dogwood
<i>Diospyros</i>	<i>virginiana</i>	common persimmon
<i>Fagus</i>	<i>grandifolia</i>	American beech
<i>Fraxinus</i>	<i>americana</i>	white ash
	<i>pennsylvanica</i>	green ash
<i>Gleditsia</i>	<i>aquatica</i>	water locust
	<i>triacanthus</i>	honey locust
<i>Gymnocladus</i>	<i>dioicus</i>	Kentucky coffeetree
<i>Ilex</i>	<i>opaca</i>	American holly
<i>Juglans</i>	<i>nigra</i>	black walnut
<i>Liquidambar</i>	<i>styraciflua</i>	sweet gum

¹Names according to: Little, Elbert L., Jr. Checklist of United States Trees (Native and Naturalized). 1978. U.S. Dept. Agr. Handbook No. 541, 375p.

<i>Maclura</i>	<i>pomifera</i>	Osage-orange
<i>Morus</i>	<i>rubra</i>	red mulberry
<i>Nyssa</i>	<i>aquatica</i>	water tupelo
<i>Plantanus</i>	<i>occidentalis</i>	American sycamore
<i>Populus</i>	sp.	cottonwood
<i>Prunus</i>	<i>serotina</i>	black cherry
<i>Quercus</i>	<i>alba</i>	white oak
	<i>bicolor</i>	swamp white oak
	<i>falcata</i> var.	
	<i>falcata</i>	southern red oak
	<i>falcata</i> var.	
	<i>pagodifolia</i>	cherrybark oak
	<i>laurifolia</i>	laurel oak
	<i>lyrata</i>	overcup oak
	<i>macrocarpa</i>	bur oak
	<i>muehlenbergii</i>	chinkapin oak
	<i>nigra</i>	water oak
	<i>nuttallii</i>	nuttall oak
	<i>palustris</i>	pin oak
	<i>phellos</i>	willow oak
	<i>shumardii</i>	Shumard oak
<i>Robinia</i>	<i>stellata</i> var.	
	<i>stellata</i>	post oak
	<i>velutina</i>	black oak
	<i>pseudoacacia</i>	black locust
	sp.	willow
	<i>albidum</i>	sassafras
	<i>heterophylla</i>	white basswood
	<i>alata</i>	winged elm
	<i>americana</i>	American elm
	<i>crassifolia</i>	cedar elm
	<i>rubra</i>	slippery elm
	<i>serotina</i>	September elm
	<i>thomassii</i>	Rock elm

Noncommercial Species

Genus	Species	Common Name
<i>Anelanchier</i>	sp.	serviceberry
<i>Bumelia</i>	sp.	chittamwood, gum
		bumelia
<i>Carpinus</i>	<i>caroliniana</i>	bluebeech, American
		hornbeam
<i>Castanea</i>	sp.	chinkapin
<i>Cercis</i>	<i>canadensis</i>	eastern redbud
<i>Cotinus</i>	<i>obovatus</i>	smoketree
<i>Crataegus</i>	sp.	hawthorn
<i>Morus</i>	<i>alba</i>	white mulberry
<i>Ostrya</i>	<i>virginiana</i>	eastern hophorn-
		beam, ironwood
<i>Planera</i>	<i>aquatica</i>	water-elm
<i>Prunus</i>	sp.	plums, cherries
<i>Quercus</i>	<i>incana</i>	bluejack oak
	<i>marilandica</i>	blackjack oak
<i>Vaccinium</i>	<i>arboresum</i>	sparkleberry

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Table 1.—Area by land classes, east Oklahoma, 1986

Land class	Area
	<i>Thousand acres</i>
Forest	
Commercial	
Timberland	4,747.5
Deferred timberland	...
Noncommercial	
Productive-reserved	23.0
Unproductive	485.9
Total forest	5,256.4
Nonforest	
Cropland ¹	1,985.7
Other	2,861.9
Total nonforest	4,847.6
All land ²	10,104.0

¹U.S. Department of Commerce, Bureau of the Census, 1982
Census of Agriculture, Volume 1 : State and County Data.

²Bureau of Census, 1980.

Table 2.—Area of timberland by ownership classes, east Oklahoma, 1986

Ownership class	Area
	<i>Thousand acres</i>
Public:	
National forest	242.6
Other federal	221.4
State	114.7
County	6.6
Total public	585.3
Private	
Forest industry	1,046.0
Farmer	1,295.6
Miscellaneous private	
Individual	1,604.2
Corporate	216.4
Total private	4,162.2
All ownerships	4,747.5

Table 3.—Area of timberland by stand size and ownership classes, east Oklahoma, 1986

Stand size class	All ownerships	National forest	Other public	Forest industry	Farmer	Miscellaneous private
	<i>Thousand acres</i>					
Sawtimber	1,169.6	123.1	110.3	226.8	327.4	328.0
Poletimber stands	1,661.3	66.0	121.2	284.5	440.7	749.0
Sapling and seedling	1,440.0	53.5	92.8	500.2	351.2	442.3
Nonstocked areas	476.6	...	18.4	34.5	176.3	247.3
All classes	4,747.5	242.6	342.7	1,046.0	1,295.6	1,820.7

Table 4.—Area of timberland by stand volume and ownership classes, east Oklahoma, 1986

Stand volume per acre	All ownerships	National forest	Other public	Forest industry	Farmer	Miscellaneous private
	<i>Thousand acres</i>					
<i>Board feet</i>						
Less than 1,500	3,419.9	107.4	245.1	715.4	941.5	1,410.6
1,500 to 5,000	1,039.8	72.0	74.8	244.2	297.9	350.9
More than 5,000	287.8	63.2	22.8	86.5	56.2	59.1
All classes	4,747.5	242.6	342.7	1,046.0	1,295.6	1,820.7

Table 5.—Area of timberland by percent growing-stock trees and cull trees, east Oklahoma, 1986

		Cull trees percent stocking						
Growing-stock Trees	Total	0-10	10-20	20-30	30-40	40-50	50-60	60+
<i>Percent stocking</i>		<i>—Thousand acres—</i>						
0-10	179.7	...	...	18.4	6.8	6.0	...	148.5
10-20	465.3	...	...	6.9	9.7	28.8	107.5	312.5
20-30	470.5	6.4	...	11.7	19.8	22.1	83.2	327.4
30-40	548.6	6.0	12.4	4.6	36.3	111.6	85.2	292.5
40-50	628.0	...	...	23.5	50.6	153.5	188.4	212.0
50-60	571.5	6.0	16.5	39.8	102.2	118.9	202.2	85.9
60-70	459.4	...	16.6	82.9	125.2	133.4	59.3	42.1
70-80	430.8	6.0	42.0	122.6	94.3	87.7	41.6	36.7
80-90	400.8	24.0	59.5	153.2	77.3	41.1	28.5	17.3
90-100	257.2	23.7	100.8	62.3	46.6	17.6	6.2	...
100-110	161.4	10.5	47.8	61.1	24.3	17.6	...	...
110-120	82.6	23.9	17.8	18.4	22.5	...	...	...
120-130	50.8	17.2	16.9	16.7	...	...	...	...
130-140	17.7	17.7	...	...	...	...	...	...
140-150	23.3	6.0	17.3	...	...	...	...	...
150-160	...	...	...	...	...	...	...	...
160+	...	...	...	...	...	...	...	...
Total	4,747.5	147.3	347.5	622.1	615.7	738.1	802.0	1,474.9

Table 6.—Average basal area of live trees on timberland by ownership, tree class, species, and tree size class, east Oklahoma, 1986

Owner and tree classes	All species	Softwood			Hardwood		
		Sapling & seedling	Poletimber	Sawtimber	Sapling & seedling	Poletimber	Sawtimber
----- Square feet per acre -----							
National forest							
Growing stock	62.9	6.9	11.0	21.8	5.4	7.9	10.0
Rough and rotten	29.3	3.2	0.3	0.6	9.7	7.4	8.1
Total	92.2	10.1	11.2	22.4	15.1	15.3	18.1
Other public							
Growing stock	35.5	0.9	3.7	6.0	4.6	10.3	10.0
Rough and rotten	35.1	0.5	0.6	0.3	11.2	9.7	12.8
Total	70.6	1.5	4.3	6.3	15.8	20.1	22.7
Forest industry							
Growing stock	39.0	7.3	8.0	10.3	3.5	6.7	3.2
Rough and rotten	16.2	1.9	0.5	0.4	6.6	3.6	3.0
Total	55.2	9.2	8.5	10.7	10.1	10.3	6.3
Farmer							
Growing stock	32.7	1.3	1.7	3.7	4.4	12.3	9.3
Rough and rotten	32.4	0.4	0.2	0.2	8.5	10.3	12.8
Total	65.0	1.6	1.9	3.9	12.9	22.6	22.1
Miscellaneous private							
Growing stock	34.4	3.0	4.0	6.3	4.1	11.1	6.1
Rough and rotten	35.1	1.0	0.5	0.4	10.2	12.0	11.1
Total	69.5	4.0	4.4	6.6	14.2	23.1	17.2
All owners							
Growing stock	36.5	3.5	4.6	7.2	4.1	10.2	6.8
Rough and rotten	29.9	1.1	0.4	0.3	9.0	9.3	9.7
Total	66.4	4.6	5.0	7.6	13.1	19.5	16.5

Table 7.—Area of timberland by site and ownership classes, east Oklahoma, 1986

Site class	All ownerships	National forest	Other public	Forest industry	Farmer	Miscellaneous private
<i>Thousand acres</i>						
165 ft or more	16.4	5.6	5.1	5.6	...	...
120 to 165 ft	127.1	33.8	...	28.5	34.9	30.0
85 to 120 ft	386.6	22.9	34.4	182.5	55.8	91.0
50 to 85 ft	2,359.8	95.8	149.9	670.4	615.6	828.2
Less than 50 ft	1,857.6	84.5	153.3	158.9	589.3	871.6
All classes	4,747.5	242.6	342.7	1,046.0	1,295.6	1,820.7

Table 8.—Area of timberland by forest types and ownership classes, east Oklahoma, 1986

Type	All ownerships	National forest	Other public	Forest industry	Farmer	Miscellaneous private
<i>Thousand acres</i>						
Loblolly-shortleaf pine	956.0	106.2	42.2	492.6	92.6	222.4
Oak-pine	757.3	60.0	36.5	294.9	90.8	275.1
Oak-hickory	2,597.1	65.2	189.2	235.7	901.6	1,205.5
Oak-gum-cypress	358.8	11.3	45.6	22.9	173.9	105.1
Elm-ash-cottonwood	78.4	...	29.1	...	36.7	12.6
All classes	4,747.5	242.6	342.7	1,046.0	1,295.6	1,820.7

Table 9.—Area of noncommercial forest land by forest types, east Oklahoma, 1986

Type	All areas	Productive reserved areas	Unproductive areas
<i>Thousand acres</i>			
Loblolly-shortleaf pine	14.1	14.1	...
Softwood total	14.1	14.1	...
Oak-hickory	494.8	8.9	485.9
Hardwood total	494.8	8.9	485.9
All types	508.9	23.0	485.9

Table 10.—Number of growing-stock trees on timberland by detailed species and diameter class, east Oklahoma, 1986

Species	Diameter class (inches at breast height)										
	All classes	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0& larger
<i>----- Thousand trees -----</i>											
Shortleaf pine	112,259	43,645	27,818	18,662	12,727	6,051	2,397	745	164	50	...
Loblolly pine	19,458	14,549	2,244	767	716	488	216	217	79	181	...
Redcedar	2,670	1,534	802	173	63	86	...	13	...	...	...
Total softwoods	134,387	59,728	30,864	19,602	13,507	6,625	2,613	975	243	231	...
Select white oaks	16,803	7,394	4,427	2,762	945	572	353	191	73	83	3
Select red oaks	9,697	3,954	2,051	1,620	861	495	251	204	85	138	39
Other white oaks	68,333	34,763	18,266	8,163	3,429	2,160	970	340	123	118	...
Other red oaks	34,477	11,982	9,291	5,584	3,106	2,128	1,106	693	351	225	10
Sweet pecan	783	319	142	99	31	92	17	14	11	55	3
Water hickory	5	...	...	...	...	...	...	...	...	5	...
Other hickories	31,296	16,642	7,784	3,789	1,613	920	401	96	21	29	...
Persimmon	666	640	...	...	25	...	...	...	...	...	...
Hard maple	114	...	...	42	27	45	...	...	...	...	...
Soft maple	1,373	793	215	127	94	46	39	...	59	...	...
Boxelder	483	202	132	95	...	36	18	...	...	...	...
Sweetgum	2,489	1,066	416	363	255	222	95	48	...	24	...
Blackgum	1,928	675	467	214	179	232	116	12	33	...	...
White ash	2,456	1,001	575	426	168	173	63	24	20	6	...
Other ashes	4,899	1,937	1,578	464	473	133	141	125	32	16	...
Sycamore	1,466	320	407	272	204	51	117	16	48	27	5
Cottonwood	2,044	451	631	330	198	111	30	52	63	173	4
Basswood	54	...	54	...	...	...	...	...	...	...	...
Willow	313	155	...	30	...	40	65	13	11	...	...
Black walnut	249	...	73	37	33	49	15	14	11	18	...
Black cherry	435	112	123	130	33	20	17	...	...	...	...
American elm	2,165	1,160	211	358	182	138	53	15	30	16	...
Other elms	9,741	5,259	2,142	1,619	431	201	49	11	20	9	...
River birch	290	135	87	...	...	37	17	...	...	14	...
Hackberry	3,317	1,275	836	781	178	188	48	...	11	...	...
Black locusts	102	102	...	...	...	...	...	...	...	...	...
Other locusts	678	...	342	240	56	22	19	...	...	...	...
Sassafras	532	407	70	54	...	...	...	...	...	...	...
Other commercial	349	196	102	51	...	...	...	...	...	...	...
Total hardwoods	197,537	90,942	50,421	27,650	12,521	8,111	4,002	1,868	1,002	956	63
All species	331,924	150,670	81,285	47,252	26,028	14,736	6,615	2,843	1,245	1,187	63

Table 11.—Volume of timber on timberland by classes of timber and by softwoods and hardwoods, east Oklahoma, 1986

Class of timber	All species	Softwood	Hardwood
<i>----- Million cubic feet -----</i>			
Sawtimber trees:			
Saw-log portion	1,155.7	647.5	508.2
Upper-stem portion	153.7	73.4	80.3
Total	1,309.4	720.9	588.5
Poletimber trees	909.7	276.5	633.2
All growing stock	2,219.1	997.4	1,221.7
Rough trees	705.7	33.4	672.3
Rotten trees	138.2	2.5	135.7
Salvable dead trees	24.6	6.6	18.0
All timber	3,087.6	1,039.9	2,047.7

Table 12.—*Volume of growing stock and sawtimber on timberland by ownership classes and by softwoods and hardwoods, east Oklahoma, 1986*

Ownership class	Growing stock			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	<i>Million cubic feet</i>			<i>Million board feet</i>		
National forest	249.5	169.0	80.5	985.8	712.2	273.5
Other public	175.7	56.7	119.1	604.2	191.6	412.7
Forest industry	507.1	349.9	157.2	1,594.4	1,264.1	330.3
Farmer	548.2	124.6	423.6	1,540.2	489.2	1,051.1
Miscellaneous private	738.6	297.2	441.4	1,963.8	1,023.1	940.7
All ownerships	2,219.1	997.4	1,221.7	6,688.5	3,680.2	3,008.3

Table 13.—*Volume of growing stock on timberland by species and diameter class, east Oklahoma, 1986*

Species	Diameter class (inches at breast height)										
	All classes	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0& larger
	<i>Million cubic feet</i>										
Shortleaf pine	875.8	94.7	145.4	191.1	195.8	136.6	71.2	29.1	8.3	3.6	...
Loblolly pine	110.8	21.8	8.5	8.5	12.8	13.2	8.4	11.2	6.4	19.9	...
Redcedar	10.8	3.1	3.0	1.8	0.9	1.6	...	0.5	...	...	...
Total softwoods	997.4	119.6	157.0	201.3	209.5	151.4	79.7	40.8	14.7	23.4	...
Select white oaks	115.8	19.5	22.4	25.6	13.7	12.5	8.0	6.7	2.8	4.4	0.2
Select red oaks	88.5	8.9	10.4	14.4	12.2	9.8	7.5	6.7	4.1	8.6	6.0
Other white oaks	310.6	68.7	75.6	59.0	37.8	33.1	19.5	8.6	3.7	4.6	...
Other red oaks	272.3	24.5	42.5	45.7	42.0	40.0	27.0	22.6	15.3	11.9	0.9
Sweet pecan	10.1	0.8	0.7	0.7	0.4	1.8	0.6	0.5	0.4	3.7	0.5
Water hickory	0.5	...	...	...	...	...	...	...	...	0.5	...
Other hickories	145.9	29.2	33.4	29.1	19.9	18.0	9.9	3.1	1.1	2.4	...
Persimmon	1.6	1.2	...	...	0.4	...	...	...	...	...	...
Hard maple	1.5	...	...	0.4	0.4	0.7	...	...	...	...	...
Soft maple	11.1	1.7	1.1	1.1	1.5	1.0	1.2	...	3.5	...	...
Boxelder	3.2	0.5	0.6	1.0	...	0.8	0.4	...	...	...	...
Sweetgum	24.0	2.1	2.3	3.2	4.9	5.2	3.2	1.5	...	1.7	...
Blackgum	16.9	1.6	1.9	1.5	2.1	4.5	3.4	0.2	1.7	...	...
White ash	16.8	2.8	2.4	3.4	2.0	3.0	1.4	0.7	0.9	0.2	...
Other ashes	38.1	5.1	9.0	4.9	6.4	2.7	3.7	3.8	1.2	1.2	...
Sycamore	23.8	1.3	3.0	3.1	4.3	1.4	4.0	0.6	2.5	2.7	1.1
Cottonwood	40.9	0.8	3.2	3.2	3.3	2.7	1.3	3.0	5.0	17.9	0.6
Basswood	0.2	...	0.2	...	...	...	...	...	...	...	...
Willow	4.1	0.2	...	0.2	...	1.0	1.9	0.3	0.4	...	...
Black walnut	3.8	...	0.3	0.3	0.4	0.9	0.6	0.2	0.5	0.8	...
Black cherry	2.9	0.3	0.6	0.9	0.4	0.4	0.4	...	...	...	...
American elm	14.3	2.0	0.8	2.9	2.2	2.4	1.3	0.4	1.5	0.7	...
Other elms	45.2	10.7	9.7	12.9	5.1	4.1	1.1	0.5	0.5	0.5	...
River birch	2.5	0.2	0.4	...	...	0.9	0.4	...	...	0.6	...
Hackberry	18.9	2.4	3.0	5.5	2.3	3.9	1.5	...	0.3	...	...
Blak locust	0.3	0.3	...	...	...	...	...	...	...	...	...
Other locusts	5.1	...	1.6	1.9	0.6	0.4	0.5	...	...	...	...
Sassafras	1.4	0.8	0.4	0.3	...	...	...	...	...	...	...
Other commercial	1.4	0.7	0.5	0.3	...	...	...	...	...	...	...
Total hardwoods	1,221.7	186.0	225.9	221.3	162.2	151.0	98.8	59.5	45.5	62.3	9.2
All species	2,219.1	305.5	382.9	422.6	371.7	302.4	178.4	100.3	60.2	85.8	9.2

Table 14.—Volume of sawtimber on timberland by species and diameter class, east Oklahoma, 1986

Species	Diameter class (inches at breast height)								
	All classes	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0& larger
----- Million board feet -----									
Shortleaf pine	3204.9	831.3	983.5	738.8	407.7	170.0	50.5	23.0	...
Loblolly pine	454.7	37.7	63.2	71.8	48.7	67.1	41.9	124.3	...
Redcedar	20.6	6.9	3.8	7.7	...	2.3	...	...	...
Total softwoods	3,680.2	876.0	1,050.4	818.2	456.4	239.4	92.5	147.4	...
Select white oaks	242.9	...	59.2	60.7	42.9	38.1	16.4	24.7	0.9
Select red oaks	290.0	...	55.6	48.3	39.7	37.9	23.3	51.7	33.5
Other white oaks	557.8	...	179.8	171.0	108.3	48.7	22.2	27.8	...
Other red oaks	801.3	...	172.7	200.4	139.4	123.8	88.9	70.5	5.5
Sweet pecan	38.9	...	1.3	9.5	2.6	2.8	2.4	18.1	2.2
Water hickory	2.8	...	...	...	...	...	...	2.8	...
Other hickories	269.7	...	87.4	89.9	53.7	16.7	6.4	15.6	...
Persimmon	1.6	...	1.6	...	...	...	...	...	...
Hard maple	6.3	...	2.0	4.3	...	...	...	...	...
Soft maple	36.4	...	5.2	5.5	5.7	...	20.0	...	...
Boxelder	6.1	...	...	3.9	2.2	...	...	...	...
Sweetgum	80.4	...	20.7	24.6	17.2	8.2	...	9.6	...
Blackgum	57.2	...	8.8	19.7	17.3	1.2	10.2	...	...
White ash	42.7	...	8.2	15.9	7.9	4.3	4.8	1.6	...
Other ashes	95.3	...	27.3	12.1	19.7	22.9	6.7	6.6	...
Sycamore	81.9	...	17.0	6.1	21.2	3.4	14.1	16.3	3.8
Cottonwood	197.3	...	13.2	12.3	5.9	18.1	32.2	112.3	3.4
Willow	17.5	...	...	4.1	9.8	1.7	1.9	...	...
Black walnut	16.8	...	1.0	3.6	3.4	1.4	2.9	4.5	...
Black cherry	5.6	...	1.4	2.0	2.2	...	...	...	...
American elm	45.0	...	11.0	13.0	6.2	2.2	8.8	3.8	...
Other elms	61.6	...	24.6	21.5	6.5	2.5	2.9	3.6	...
River birch	10.7	...	...	4.5	2.3	...	...	3.9	...
Hackberry	36.5	...	9.4	18.4	7.4	...	1.4	...	...
Other locusts	6.0	...	2.3	1.5	2.2	...	...	...	...
Total hardwoods	3,008.3	...	709.7	752.7	523.8	334.0	265.5	373.5	49.2
All species	6,688.5	876.0	1,760.1	1,570.9	980.1	573.4	358.0	520.9	49.2

Table 15.—Volume of sawtimber on timberland by species and tree grade, east Oklahoma, 1986

Species	All grades	Grade 1	Grade 2	Grade 3	Grade 4
<i>Million board feet</i>					
Yellow pines	3,659.5	451.3	781.0	2,427.3	...
Redcedar	20.6	20.6	...	...	...
Total softwoods	3,680.2	471.9	781.0	2,427.3	...
Select white-red oaks	532.9	52.0	134.3	198.2	148.4
Other white-red oaks	1,359.1	45.5	190.3	603.7	519.7
Hickory	311.4	15.0	49.0	132.9	114.5
Hard maple	6.3	...	...	...	6.3
Sweetgum	80.4	4.4	23.7	36.7	15.6
Tupelo and blackgum	57.2	3.3	17.5	25.2	11.1
Ash-walnut-black cherry	160.4	36.9	42.5	72.7	8.3
Other hardwoods	500.6	155.1	122.2	161.0	62.3
Total hardwoods	3,008.3	312.2	579.5	1,230.4	886.2
All species	6,688.5	784.1	1,360.5	3,657.7	886.2

Table 16.—Average net annual growth and average annual removals of growing stock on timberland, by species, east Oklahoma, 1986

Species	Growth	Removals
----- Million cubic feet -----		
Yellow pines	45.2	53.8
Cypress	...	0.1
Redcedar	0.7	0.5
Total softwoods	45.9	54.4
Select white-red oaks	7.1	3.2
Other white-red oaks	21.7	17.0
Hickory	4.1	3.5
Hard maple	0.1	...
Sweetgum	0.6	1.4
Tupelo and blackgum	0.1	0.5
Ash-walnut-black cherry	2.1	0.9
Other hardwoods	2.7	3.1
Total hardwoods	38.5	29.5
All species	84.4	83.9

Table 17.—Net annual growth and removals of growing stock on timberland by ownership classes and by softwoods and hardwoods, east Oklahoma, 1986

Ownership class	Net annual growth			Annual removals		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
----- Million cubic feet -----						
National forest	7.5	5.7	1.8	4.3	2.7	1.6
Other public	7.7	2.2	5.5	2.2	0.9	1.2
Forest industry	22.0	17.4	4.6	50.7	40.0	10.7
Farmer	19.1	5.4	13.7	11.3	1.2	10.2
Miscellaneous private	28.2	15.3	12.9	15.4	9.6	5.8
All ownerships	84.4	45.9	38.5	83.9	54.4	29.5

Table 18.—Average net annual growth and average annual removals of sawtimber on timberland, by species, east Oklahoma, 1986

Species	Growth	Removals
----- Million board feet -----		
Yellow pines	188.1	203.6
Cypress	0.1	0.4
Redcedar	0.5	0.2
Total softwoods	188.7	204.2
Select white-red oaks	22.0	8.8
Other white-red oaks	62.1	44.7
Hickory	9.0	10.8
Hard maple	0.5	...
Sweetgum	4.2	4.3
Tupelo and blackgum	0.9	2.0
Ash-walnut-black cherry	8.3	1.5
Other hardwoods	15.8	9.4
Total hardwoods	122.7	81.5
All species	311.4	285.7

Table 19.—*Net annual growth and removals of sawtimber on timberland by ownership classes and by softwoods and hardwoods, east Oklahoma, 1986*

Ownership class	Net annual growth			Annual removals		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	<i>-----Million board feet-----</i>					
National forest	32.7	26.3	6.4	12.9	9.5	3.5
Other public	33.1	8.8	24.3	4.5	2.3	2.1
Forest industry	77.5	66.9	10.6	183.3	155.3	28.0
Farmer	74.0	26.1	47.9	38.9	4.1	34.8
Miscellaneous private	94.1	60.5	33.6	46.1	33.0	13.1
All ownerships	311.4	188.7	122.7	285.7	204.2	81.5

Table 20.—*Average annual mortality of growing stock and sawtimber on timberland, by species, east Oklahoma, 1986*

Species	Growing stock	Sawtimber
	<i>Million cubic feet</i>	<i>Million board feet</i>
Yellow pines	2.8	8.2
Total softwoods	2.8	8.2
Select white-red oaks	1.2	3.4
Other white-red oaks	4.5	9.5
Hickory	2.1	6.6
Sweetgum	...	...
Tupelo and blackgum	...	...
Ash-walnut-black cherry	0.6	1.2
Other hardwoods	5.7	19.8
Total hardwoods	14.1	40.6
All species	16.9	48.8

Table 21.—*Average annual mortality of growing stock and sawtimber on timberland by ownership classes and by softwoods and hardwoods, east Oklahoma, 1986*

Ownership class	Growing-stock			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	<i>-----Million cubic feet-----</i>			<i>-----Million board feet-----</i>		
National forest	0.8	0.4	0.4	2.4	1.5	0.9
Other public	1.6	...	1.6	5.3	0.2	5.1
Forest industry	3.4	1.4	2.0	11.7	4.1	7.7
Farmer	4.2	0.1	4.1	10.0	0.5	9.5
Miscellaneous private	6.9	0.8	6.1	19.3	1.9	17.4
All ownerships	16.9	2.8	14.1	48.8	8.2	40.6

Table 22.—*Average annual mortality of growing stock and sawtimber on timberland by causes of death and by softwoods and hardwoods, east Oklahoma, 1986*

Ownership class	Growing-stock			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	<i>-----Million cubic feet-----</i>			<i>-----Million board feet-----</i>		
Bark beetles	0.8	0.8	...	3.1	3.1	...
Other insects	0.1	0.1	...	...	...	...
Disease	11.5	0.9	10.5	31.4	2.2	29.3
Fire	0.5	0.2	0.3	0.2	0.2	...
Beaver	0.3	...	0.3	0.2	...	0.2
Weather	2.8	0.6	2.3	11.9	2.3	9.6
Suppression	0.1	0.1	0.1	...	...	...
Other	0.7	0.1	0.6	2.0	0.5	1.5
All causes	16.9	2.8	14.1	48.8	8.2	40.6

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Presents the principal findings of the fifth forest survey of east Oklahoma and the changes that have occurred since earlier surveys. Trends in forest area, ownership, forest type, stand structure, stocking, timber volume, growth, removals, mortality, management opportunities, and timber products output are discussed.

Additional keywords: forest inventory, tree distribution, basal area.



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William H. McWilliams and Roger G. Lord



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Forest Resources of East Texas

William H. McWilliams and Roger G. Lord

HIGHLIGHTS

Some important findings of the most recent survey of east Texas forest resources are as follows:

- The acreage of timberland, now 11.6 million acres, changed very little since 1975, but significant changes occurred among forest types. The changes include a 10-percent decrease in pine stands, a 5-percent decrease in oak-pine stands, a 28-percent increase in oak-hickory stands, and a 12-percent decrease in bottomland hardwood stands.
- The area of pine plantations roughly doubled since 1975. Pine plantations now occupy 1.2 million acres or 28 percent of the pine forest. Forest industry owns 74 percent of the pine plantation acreage. An additional 0.6 million acres of timberland showed evidence of planting but is currently classified as oak-pine and hardwood forest types due to hardwood dominance.
- Stand structure changed substantially since the previous survey. Declines in the number of live softwood trees occurred in the 6- through 16-inch diameter classes. Hardwoods declined in the 2- through 14-inch classes. Increases were evident in larger diameters for both species groups but were most pronounced for softwoods.
- The area of understocked stands expanded by 32 percent, mostly due to increases in the area of young understocked oak-hickory stands that developed following heavy cutting in pine and oak-pine stands.
- The area of stands with a high stocking of cull trees more than doubled, now totaling 1.0 million acres.
- The total volume of growing stock increased by 2 percent and is now 12.5 billion cubic feet. Softwood growing-stock volume decreased by 2 percent to 7.9 billion cubic feet, while hardwood growing-stock volume increased by 10 percent to 4.5 billion cubic feet.
- The drop in softwood growing-stock inventory resulted from a moderate decrease in net annual softwood growth, combined with a dramatic increase in average annual removals (46 percent) and a mortality rate more than double the 1975 level. Average annual softwood removals now total 479.2 million cubic feet per year, and exceed net annual growth, which is 463.2 million cubic feet per year.
- The hardwood growing-stock inventory increased despite an 18 percent decrease in net annual growth, a 40 percent increase in average annual removals, and a mortality rate more than double the 1975 level. Net annual hardwood growth is 163.6 million cubic feet per year and exceeds average annual removals of 132.8 million cubic feet per year, but the margin is much smaller than in 1975.
- East Texas timberland supports 451.4 million tons of woody biomass (dry weight). Fifty-eight percent of the biomass is hardwood and 42 percent is softwood. Loblolly pine is the dominant species, comprising 28 percent of the total biomass.
- Harvesting activity impacted 4.9 million acres or 42 percent of the total timberland area. Cutting was most intensive on forest industry land where 2.3 million acres were harvested; this is 60 percent of their total timberland base in 1975. Seventy-three percent of the harvesting by all owners was conducted in pine and oak-pine stands. There are currently 698.6

thousand acres of heavily-cut pine and oak-pine stands lacking adequate pine regeneration. Sixty percent of this timberland is owned by nonindustrial private owners.

- Industrial timber output increased since 1974. Pulpwood had the largest share of total output in 1985 (52 percent) and gained by 7 percent since 1974. Hardwood pulpwood output rose sharply and contributed 23 percent of total pulpwood output by 1985. Sawtimber output dropped off considerably after steady increases between 1975 and 1978, and then recovered over the past 3 years.
- Over the next 10 years timber demand will be satisfied more from nonindustrial private lands than in the past. Expanded pine regeneration efforts will be needed on nonindustrial private land as harvesting of pine and oak-pine stands increases during that period. Over the longer-term future, timber supply from forest industry pine plantations established over the past decade will increase considerably.

INTRODUCTION

This Bulletin provides an overview of the fifth comprehensive survey of east Texas forest resources. The survey was conducted by the Forest Inventory and Analysis Unit (FIA) of the USDA Forest Service, Southern Forest Experiment Station. Earlier surveys were completed for 1904 (Bray 1904), 1935 (Cruikshank 1938; Cruikshank and Eldredge 1939; Davis 1940), 1953–1955 (USDA-FS 1956), 1965 (Sternitzke 1967), and 1975 (Murphy 1976).

The present survey covers the “Pineywoods” of east Texas (fig. 1). Data are reported for January 1, 1986. Comparisons, unless otherwise noted, are made between surveys taken in 1975 and 1986. The 43 counties surveyed were divided into two survey regions: Southeast and Northeast. Pine-fringe counties, which include Grimes, Henderson, Leon, Madison, Van Zandt, and Waller counties were added to these survey regions since the previous survey in 1975. All comparisons of the 1975 and 1986 forest statistics made in this report account for this change.

As a supplement to the Pineywoods inventory, a survey of the “Lost Pines” was conducted. The Lost Pines consists of a population of loblolly pine separated from loblolly of the Pineywoods. The survey took place in Bastrop, Caldwell, Colorado, Fayette, and Lee counties. Forest statistics for the Lost Pines are presented in the last section of this report and are included in table XXI and figures 28 and 29 only.

HISTORY

Prior to settlement, east Texas was a wilderness dominated by virgin forests. Of the four major forest types present in the region, three constituted the western-most edge of the southern pine region. The longleaf forest type occupied roughly 5,000 square miles in southeast Texas, from Hardin, Polk, and Angelina counties east to the Louisiana border. Kept open by recurrent fires, these nearly pure stands often contained trees 150 to 200 feet tall and 4 to 5 feet in diameter. To the south and west of the longleaf region a band of loblolly pine forests covered an estimated 6,000 to 7,000 square miles. On wetter lowland sites loblolly grew in pure stands, while on upland sites the species was mixed with upland hardwood species. To the north of the longleaf and loblolly regions, extending to the Red River, was an estimated 30,000 square miles of shortleaf pine forest, often mixed with a variety of hardwood species including post oak and other upland oaks, hickory, elm, and sweetgum. To the west of the southern pine forests, extending from the Red River south to the Gulf coastal plain, was a region of scrubby post oak woodlands, which gradually merged into the Black Prairie Belt of east central Texas. A fifth, less extensive forest type, the bottomland hardwoods, was found along the stream and river bottoms throughout east Texas. Bottomland hardwood forests consisted of a large variety of species. Along larger rivers, the band of lowland forest was five or more miles in width. In aggregate, it covered several thousand square miles.

Water and steam-powered lumber mills appeared as early as the 1820's, but because of their small size, these mills had little impact on the forest resource. It was not until the late 1800's that the first lumber mills of any significance were introduced (Maxwell and Baker 1982).

As the white pine forests in the northern United States were depleted during the latter part of the 1800's, lumber operators began looking to the South for new sources of wood. New milling technologies, especially the invention of the band saw, allowed increased production and made the construction of large, permanent mills economically attractive. At the same time, the Post-Civil War southern railroad network was finally expanding to allow better access to the east Texas Pineywoods (Maxwell and Baker 1982). The Post-War westward migration caused a surge in the Texas population, creating new demands for wood from which to build cities like Houston, Beaumont, and Dallas.

The development of the 19th Century lumber empires in Texas paralleled a pattern repeated throughout the South. Mill operators purchased large tracts of timberland, built a mill and supporting “company town” and constructed spur

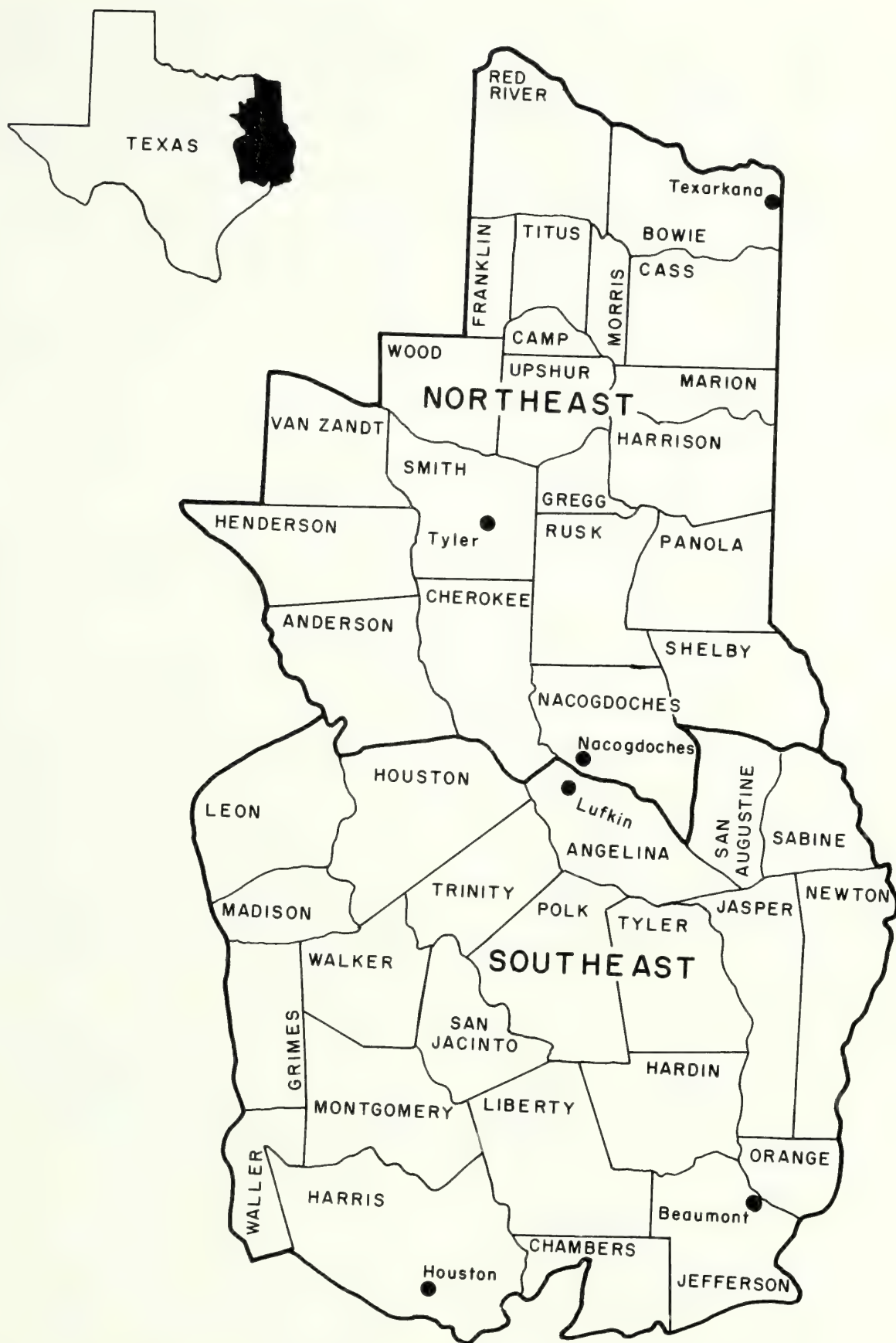


Figure 1.—The forest survey regions of east Texas.

tracks into the woods off the main railways to provide access to the virgin timber. Most of this development occurred in southeast Texas, close to the dense longleaf forest, population centers, and gulf ports. However, large lumber mills also operated in northeast Texas.

The period between 1880 and 1930 constituted the "Bonanza Era" of Texas lumbering (Maxwell and Baker 1982). Dozens of company towns, such as Diboll, Kirbyville, and Camden, sprang up and thrived on the operations of large mills. Annual lumber production expanded rapidly from 0.3 billion board feet in 1880 to a peak of 2.2 billion board feet in 1907. More than 600 lumber mills were operating in the State at that time, although only about 100 to 200 of these were of any size (Maxwell and Baker 1982). Annual production remained above the 1.0-billion-board-foot mark from 1906 through 1930. Jasper, Polk, and San Augustine counties were the largest lumber-producing counties.

As had happened 30 years previously in the northern States, rapid cutting of the old-growth timber took its toll on the forest resource. By 1917, only 3.0 million acres of virgin forest remained in east Texas. Almost 8.0 million acres consisted of cut-over land, and only 1.7 million acres had successfully regenerated into second growth stands (Foster 1917a). In a typical discussion of the forest resource at that time, Texas' first state forester, J. H. Foster, described the status of Polk County's forest:

"The bodies of virgin timber are scattered and practically all of the timber easily accessible to the railroads has been cut out. The woodlands of Polk County are practically barren of pine reproduction as a result of clear cutting and fires. There is little value placed upon the second growth of timber which may be derived from the protected areas, and sentiment in the county seems to strongly favor burning of the grass and woodlands." (Foster 1917b, p. 40)

Growing concern over the alarming rate of harvesting and widespread forest fires prompted action in the first decades of the 1900's. At the urging of W. Goodrich Jones, a conservation leader in the State, the Texas Forest Service was created in 1915 as part of the Agricultural and Mechanical College of Texas. In 1916, a cooperative Federal and State program of wildfire control was implemented under the provisions of the 1911 Weeks Law. In 1923, the Texas Legislature appropriated money to hire a forester to assist private landowners with forest management. A state nursery was established by the Texas Forest Service in 1926 to support reforestation efforts (Texas Society of American Foresters 1984).

Around 1924, the boom era of Texas lumbering began to come to an end. Having exhausted their timber supplies, more and more large mills closed down. The Depression hastened the end for many companies. Thriving company towns were rapidly transformed into ghost towns. Production levels hit bottom in 1932. Although lumber production recovered to the 1.0-billion-board-foot level after the Depression, the industry never regained the regional dominance it had enjoyed during the "Bonanza Era" (Maxwell and Baker 1982).

It had always been assumed that most of the cut-over timberland would be developed into farms, but this never happened. Thousands of cut-over acres abandoned by the big timber companies were available for sale in the mid-1930's. In 1933, the Texas Legislature authorized the Federal Government to purchase land in Texas to establish National Forests. The U.S. Forest Service quickly acquired about 660,000 acres for this purpose and with the help of the Civilian Conservation Corps began reforestation and implementing conservation practices on four newly established National Forests (Texas Society of American Foresters 1984; Maxwell and Baker 1982).

The first of a series of forest surveys of east Texas was completed in 1935 by the USDA Forest Service, Southern Forest Experiment Station (Cruikshank 1938; Cruikshank and Eldredge 1939). The survey documented the last phase of the old-growth forest and the transition of a second growth forest. According to the survey, less than 1.5 million acres of virgin forest remained in east Texas, and most of this was in hardwood forest types. Eighty-four percent of the forest was second growth. The second growth stands were poorly stocked and producing much less than their potential. The report called for intensified fire protection efforts, technical assistance to aid farmers in growing timber, and reforestation of abandoned agricultural lands.

Perhaps the most important event within Texas forestry of the 1930's and 40's was the development of the southern pine newsprint industry. Although kraft paper mills had used southern pine as early as 1910, it was thought that newsprint could not be produced because of the high resin content of southern pines. This technological barrier was broken in the late 1930's. Southland Paper Mills established the first mill in the South in Lufkin, in 1940. The industry quickly expanded, providing a profitable outlet for smaller diameter trees (Maxwell and Baker 1982). By 1955, pulpwood accounted for 33 percent of the pine harvest (USDA-FS 1956).

The second forest survey was conducted in 1955 (USDA-FS 1956). During the interval between surveys, the resource picture had changed dramatically.

Nearly half of the timberland in the Southeast region was now under industrial ownership, and the condition of the resource there was rapidly improving because of the implementation of forest management practices. Timberland acreage and growth had increased, as had stocking and inventory levels. In the Northeast region, a lack of management on small nonindustrial landholdings caused the forest resource to be further depleted by overcutting, fire, and grazing. It became apparent that more attention to forest management and fire protection on non-industrial lands was needed if the timber resource was to be re-established in the region.

The advent of the federal Soil Bank Program in 1956 aided the efforts aimed at reforesting non-industrial land. The program also helped to expand the Texas Forest Service's tree nursery capabilities so that more trees were available to landowners at low cost. Fire and pest control efforts were also improved during this period, thus reducing the risk of investment in tree planting (Texas Society of American Foresters 1984).

Another landmark of Texas forestry industry expansion occurred in 1964 with the birth of the southern pine plywood industry and the opening of two such mills in Texas (Texas Society of American Foresters 1984). Ten years later, nine plywood plants were operating within the State.

The forest surveys of 1965 and 1975 indicated steady improvement in the condition of the forest resource (Sternitzke 1967; Murphy 1976). Both surveys reported that growth of pine exceeded harvest, resulting in dramatic inventory increases for both the Northeast and Southeast regions. Statewide, pine inventory increased 40 percent between 1955 and 1965, and another 23 percent in the next 10 years. Hardwood harvest remained above growth in the 1965 survey, but this situation reversed by 1975, when hardwood harvest was less than half of growth.

Over the past 2 decades, management of Texas forests has intensified. Pine plantations, often established with genetically superior pine seedlings, have become the mainstay of forest industry land management. Industry regularly practices stand improvements such as release, thinning, and prescribed burning. Reforestation on nonindustrial lands, which dropped off following the end of the Soil Bank program in 1963, regained momentum with the initiation of the federally-funded Forest Incentives Program (FIP) in 1974. A similar industry-funded program, the Texas Reforestation Foundation (TRe), was established in 1981 to supplement the FIP program (Barron 1983). Both programs have also assisted landowners in site preparation and timber stand improvement.

FOREST AREA

The total land base of the east Texas Pineywoods is 21.6 million acres, of which 55 percent (11.8 million acres) is classified as forest (appendix table 1). Ninety-eight percent of the forest land (11.6 million acres) is in the timberland category (see Definition of Terms section). Timberland accounts for more than 40 percent of the land area in more than two-thirds of the counties surveyed with highest concentrations occurring in the Southeast region (fig. 2). Noncommercial forest land makes up the remaining 2 percent of forest land (234.2 thousand acres) and is roughly split between productive-reserved and unproductive forest land. Most of the unproductive acreage is located along the western fringe of the Pineywoods region.

Nonforest land totals 9.8 million acres. About one-third of the nonforest acreage is cropland. The remaining two-thirds includes pasture or rangeland, residential areas, cities, wooded areas less than an acre in size, and other miscellaneous land uses.

Land-Use Change

An insignificant decline of 1 percent occurred in the area of timberland since 1975 (table I). The change is the net result of land entering and departing the timberland base. Diversions to agricultural and other uses such as urban and suburban expansion affected 827.8 thousand acres of timberland. This was offset by 731.1 thousand acres reverting to timberland. Eighty-seven percent of the reverting acreage shifted from agricultural use. About two-thirds of the reversions from agricultural use occurred in the Northeast region.

Ownership

Nearly all timberland in east Texas (93 percent) is privately owned (appendix table 2). Nonindustrial private timberland owners control the largest share of timberland with 61 percent of the total, or 7.0 million acres. The size of the nonindustrial private timberland base is essentially unchanged since 1977. Nonindustrial timberland is most heavily concentrated in the northern and western parts of east Texas (fig. 3).

The nonindustrial private group represents a variety of owners including farmers, corporations (other than forest industries), hunting clubs, and other individuals. Other individuals hold 80 percent of the nonindustrial private timberland.

Forest industry timberland occurs primarily on the more productive sites that are found in the southeastern part of east Texas. One-third of east

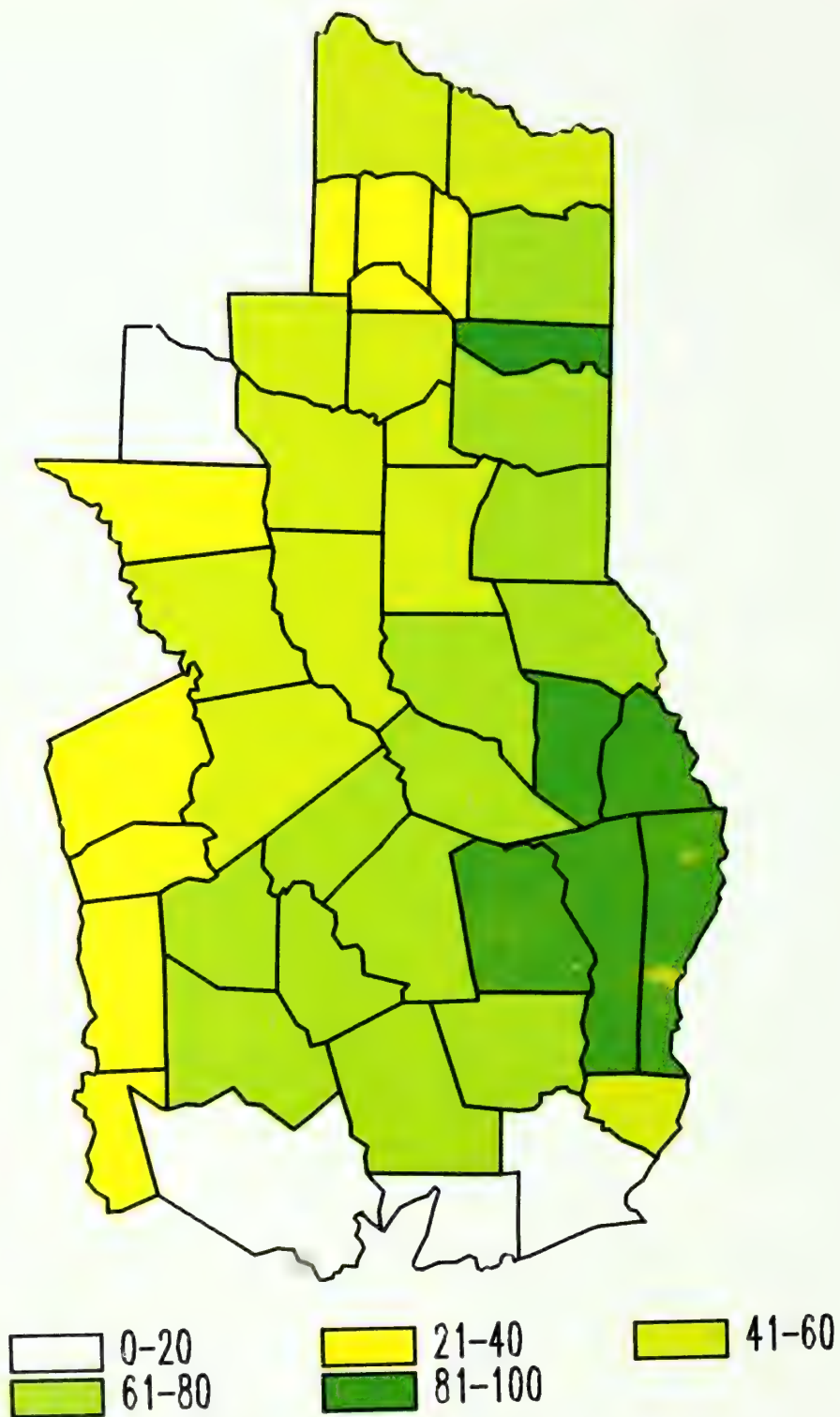


Figure 2.—Percent timberland area in east Texas counties, 1986.

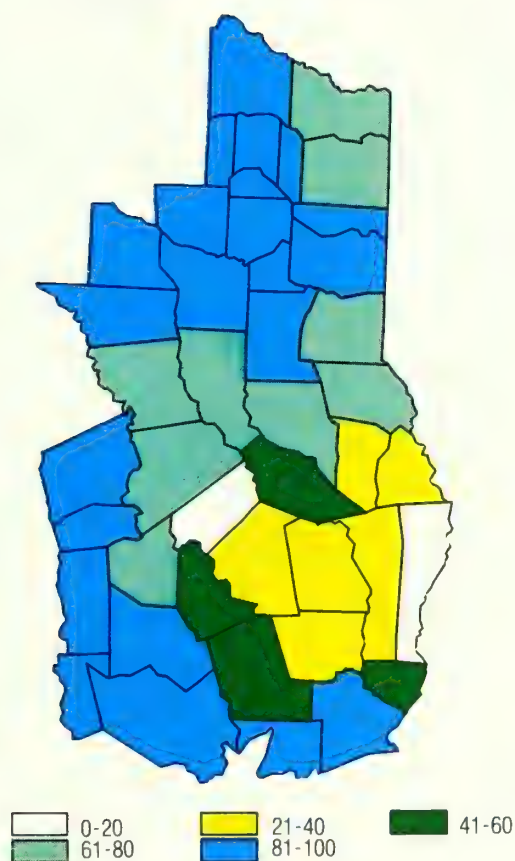
Table I.—Changes in timberland by survey region, east Texas, 1975–1986

Survey region	All land ¹	Timberland	Net change	Additions from:			Diversions to:		
				Total	Agriculture	Other ²	Total	Agriculture	Other ²
-----Thousand acres-----									
Southeast	10,424.0	6,666.5	-140.0	277.2	214.2	63.0	417.2	188.0	229.2
Northeast	11,169.7	4,898.8	43.3	453.9	419.5	34.4	410.6	179.0	231.5
All regions	21,593.7	11,565.3	-96.7	731.1	633.7	97.4	827.8	367.0	460.7

¹United States Department of Commerce, Bureau of the Census, 1981.

²Includes urban, industrial, highway, noncommercial forest, water, rights-of-way, and other land uses.

NONINDUSTRIAL PRIVATE



FOREST INDUSTRY

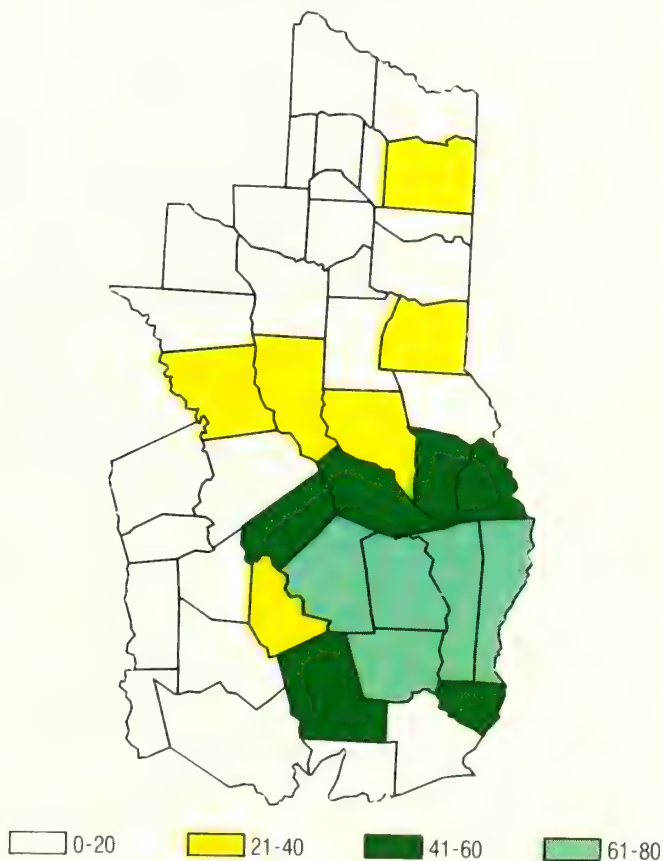


Figure 3.—Percent timberland area held by nonindustrial private landowners and forest industries, 1986.

Texas' timberland is owned by forest industries (3.8 million acres). The high concentration of forest industry timberland in east Texas ranks second only to Florida among the southern states. There was no significant change in the overall size of the industrial timberland base since 1975; however, timberland exchanges and mergers between companies concentrated ownership among a smaller number of owners (O'Laughlin and Bell 1986). According to O'Laughlin and Bell, seven large companies controlled more than 90 percent of the industry timberland in 1984. Further consolidation has occurred since that time.

Public owners hold a minor 7 percent of the timberland base (763.0 thousand acres) but are the dominant source of timber in some local areas. Nearly all of the publicly-owned acreage (80 percent) occurs on National Forests. Other public owners include State, county, and municipal governments as well as other Federal agencies.

Forest Type

Forest type classification is based on the stocking of dominant and codominant trees in sampled stands. Stands are grouped into broad forest types according to stocking plurality by FIA forest type standards. For example, the oak-pine forest type includes all stands in which the hardwood species comprise the plurality of stocking, but in which the softwood species comprise at least 25 percent of total stocking. Death or removal of a few softwood trees in stands with near borderline softwood stocking would

shift the stand to a hardwood forest type. Therefore, forest type shifts are very sensitive to factors affecting species dominance.

Forest type shifts result from natural and man-induced forces. Natural factors include the normal tendency of stands to shift dominance from pine to hardwood and the disturbances of weather, fire, insects, and disease. Man-induced factors include clearing for nonforest use, harvesting, regeneration efforts, management treatments, fire suppression, and miscellaneous factors. The issue of shifts among forest types usually involves the interaction of both natural and man-induced forces.

Pine-type timberland is comprised of the loblolly-shortleaf and longleaf-slash forest types. Overall, pine-type timberland decreased by 10 percent since 1975. Oak-pine forests are dominated by hardwood species but are often well stocked with pine timber. Pine and oak-pine forests are most concentrated in the Southeast region (fig. 4).

Loblolly-shortleaf pine is the dominant forest type in east Texas and occupies about one-third of the timberland area (table II). This type underwent a 12-percent decline since 1975. Roughly two-thirds of the total decrease was in the Southeast region. Much of the decline likely results from the dramatic increase in harvesting of pine stands on forest industry land (McWilliams and Skove 1987). Harvested stands are often categorized as hardwoods until pines become established.

The loblolly-shortleaf type is most common in the Southeast region where it comprises 41 percent of the timberland (3.9 million acres). Loblolly pine is by

Table II.—Area of timberland and percent change by forest type, and survey region, east Texas, 1986¹

Survey region	All types	Longleaf-slash	Change	Loblolly-shortleaf	Change	Oak-pine	Change
	<i>Thousand acres</i>	<i>Thousand acres</i>	<i>Percent</i>	<i>Thousand acres</i>	<i>Percent</i>	<i>Thousand acres</i>	<i>Percent</i>
Southeast	6,666.5	255.3	21	2,746.0	-11	1,333.9	-11
Northeast	4,898.8	24.6	-48	1,190.6	-14	1,067.9	5
All regions	11,565.3	279.9	8	3,936.6	-12	2,401.8	-5

	Oak-hickory	Change	Oak-gum-cypress	Change	Elm-ash-cottonwood	Change
	<i>Thousand acres</i>	<i>Percent</i>	<i>Thousand acres</i>	<i>Percent</i>	<i>Thousand acres</i>	<i>Percent</i>
Southeast	1,498.3	46	827.1	-14	5.8	-83
Northeast	1,871.0	16	692.0	-2	52.7	-40
All regions	3,369.3	28	1,519.1	-9	58.5	-52

¹Rows and columns may not sum to totals due to rounding.

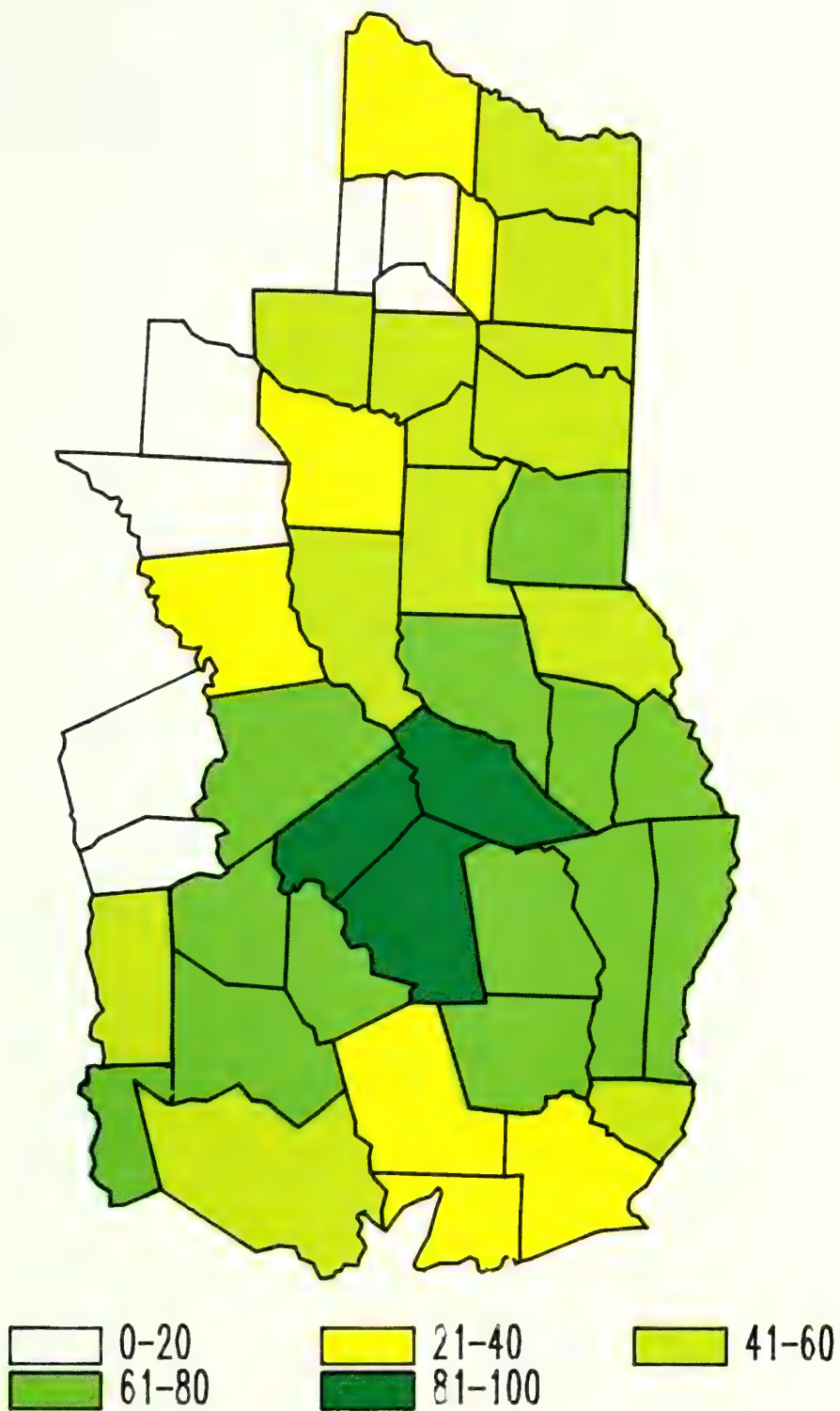


Figure 4.—Percent timberland classified as pine and oak-pine forest types in east Texas counties, 1986.

far the most important species, in terms of merchantable volume, of the loblolly-shortleaf type in the Southeast region (fig. 5). In contrast, loblolly pine shares dominance with shortleaf pine in the Northeast region.

The longleaf-slash pine forest type represents only 2 percent of total timberland (279.9 thousand acres) but has expanded in area in the Southeastern region since 1975. Slash pine is the dominant species, representing a plurality on 245.2 thousand acres, while longleaf represents a plurality on only 34.7 thousand acres, mostly in the Southeast region.

The oak-pine type occupies 21 percent of east Texas' timberland (2.4 million acres). It declined slightly since 1975. Declines occurred in the Southeast region, while increases were apparent in the Northeast region. As with the loblolly-shortleaf forest type, loblolly pine dominates in the Southeast region and shares dominance with shortleaf pine in the Northeast region.

The oak-hickory type ranks a close second to loblolly-shortleaf forests in terms of timberland area with 29 percent of the total (3.4 million acres). The oak-hickory type expanded by 726.2 thousand acres with two-thirds of the increase in the Southeast region. Increases in the oak-hickory type are often the result of heavy cutting in pine and oak-pine stands.

Oak-hickory type timberland is found throughout east Texas but is most concentrated in northern and western areas. The type is very common in the pine belt of southeastern Texas on cut-over sites that lack pine regeneration. The composition of oak-hickory forests includes several other hardwood species, sweetgum being the most dominant.

Bottomland hardwood types occupy 14 percent (1.6 million acres) of the timberland base. Although comprised primarily of the oak-gum-cypress forest type, some acreage in the elm-ash-cottonwood type is included. Bottomland forests exhibit a diverse species mix that includes several oaks, gums, ash, baldcypress, and often loblolly pine. These forests are

very important for quality hardwood timber as well as wildlife habitat. The area in bottomland types declined by 12 percent—continuing a long-term downward trend. The main causes for the decline are the development of man-made lakes that permanently flood bottomland areas, logging of accessible mature stands, and shifts to cropland.

Plantations

Perhaps the most consequential trend that has developed since the previous survey has been the increase in pine plantation establishment, particularly on forest industry land. Currently east Texas has 1.2 million acres of pine plantations—about twice the area recorded in the 1975 survey. An additional 613.3 thousand acres of young plantations are classified as oak-pine and hardwood forest types because the hardwood component dominates stocking of these areas (table III).

Pine plantations occupy only 10 percent of east Texas' timberland; however, an important change has taken place in the pure pine timberland base. Pine plantations now occupy 28 percent of the pine type timberland in contrast to only 12 percent in 1975. The distribution of timberland by forest class reflects the high concentration of pine plantations on forest industry land (table IV). Forest industry controls about three-fourths of the pine plantation acreage, but only one-third of the overall timberland base. Nonindustrial private owners control 20 percent of the pine plantations, and 60 percent of the total timberland.

The current rate of planting can be put into perspective through review of the planting history in east Texas. Prior to the 1950's, planting was sporadic as reforestation of cut-over sites and abandoned fields relied on natural regeneration (USDA-FS 1955-1985). The Soil Bank Program of the late 1950's spurred planting on nonindustrial property

Table III.—Area of timberland classified as plantations¹ by ownership, and forest type, east Texas, 1986²

Ownership	All types	Longleaf-slash	Loblolly-shortleaf	Oak-pine	Oak-hickory	Bottomland hardwoods ³
-----Thousand acres-----						
Public	99.0	5.3	69.5	.....	24.2	.....
Forest industry	1,331.6	179.7	688.9	284.3	160.5	18.2
Nonindustrial private	361.5	18.5	216.8	59.5	43.2	23.5
All owners	1,792.1	203.5	975.2	343.8	227.9	41.6

¹Timberland having evidence of artificial regeneration, which includes planting or direct seeding.

²Rows and columns may not sum to totals due to rounding.

³Includes oak-gum-cypress and elm-ash-cottonwood forest types.

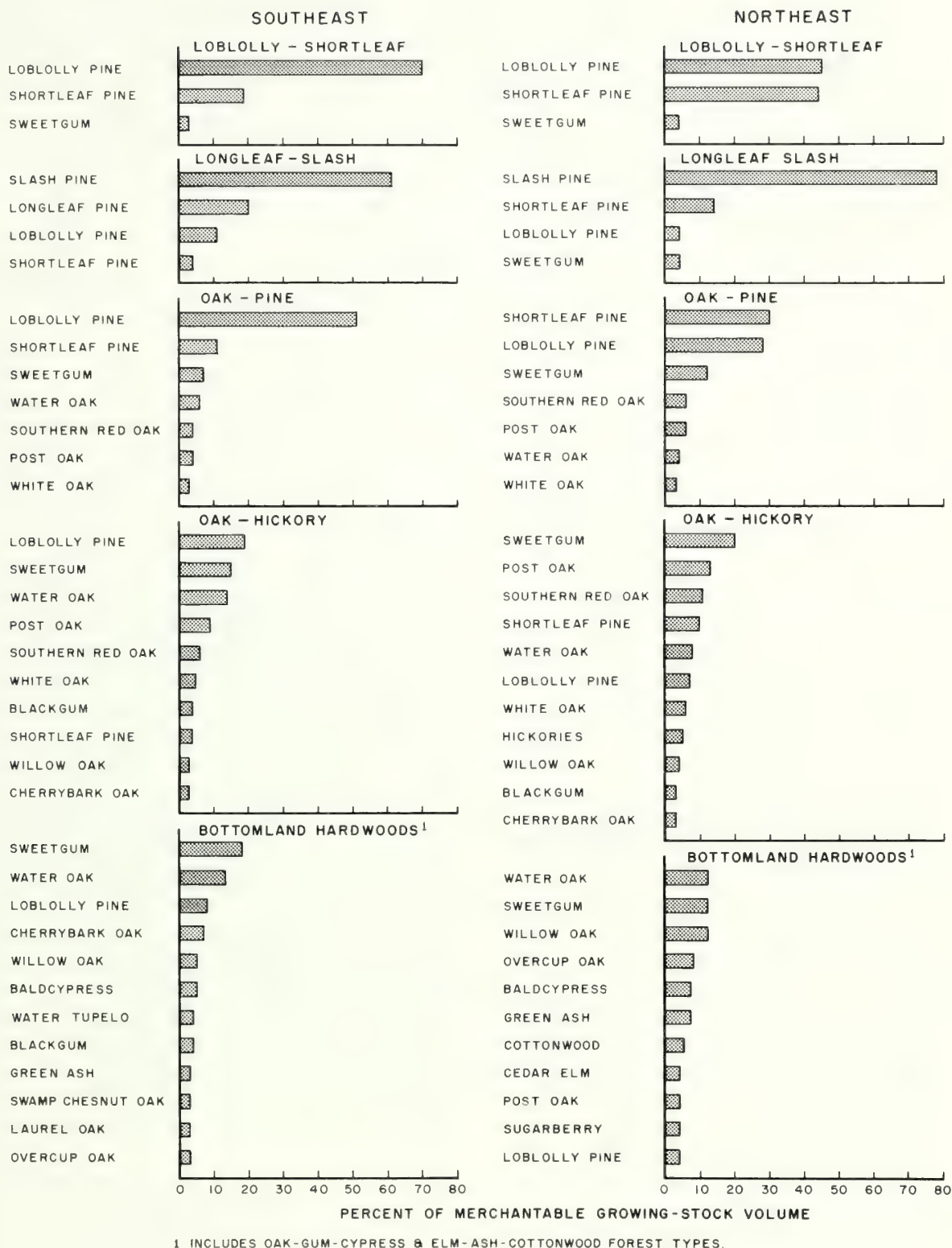


Figure 5.—Relative species importance by forest type, and survey region, 1986. The importance value is merchantable volume and species with less than 3 percent are excluded.

Table IV.—Area of timberland by ownership, and forest class, east Texas, 1986¹

Ownership	Total	Pine plantation ²	Natural pine ³	Oak-pine	Oak-hickory	Bottomland hardwoods ⁴
-----Thousand acres-----						
Public	763.0	74.8	414.7	95.7	123.9	53.9
Forest industry	3,795.5	868.6	815.6	872.7	798.5	440.1
Nonindustrial private	7,006.8	235.3	1,807.6	1,433.3	2,446.9	1,083.7
All classes	11,565.3	1,178.7	3,037.9	2,401.8	3,369.3	1,577.7

¹Rows and columns may not sum to totals due to rounding.

²Includes longleaf-slash and loblolly-shortleaf stands having evidence of artificial origin.

³Includes longleaf-slash and loblolly-shortleaf stands having no evidence of artificial origin.

⁴Includes oak-gum-cypress and elm-ash-cottonwood forest types.



Figure 6.—Area of forest planting by ownership, 1955 to 1985.

(fig. 6). Planting on nonindustrial land dropped in subsequent years from a peak of 62.1 thousand acres in 1959 and remained less than 10.0 thousand acres per year until 1977. Assistance programs since then caused planting on nonindustrial land to trend upward.

On forest industry land, increased planting began around 1960 and continued for about 5 years. During the period from 1956 to 1965, 167.6 thousand acres of forest industry land were planted. The next 10 years were characterized by an upward surge as 426.1 thousand acres were planted. Over the past decade planting more than doubled with over a million acres of pine plantations being established.

Recently established pine plantations will have a positive impact on softwood timber supply. Short-term effects on softwood growing-stock inventory are negative because older high-volume stands are replaced with young pine stands that don't contribute to the inventory until they grow to the minimum 5.0-inch merchantability limit used by FIA. Net growth of softwoods is also affected because young stands with no merchantable growth replace older stands with high levels of accretion.

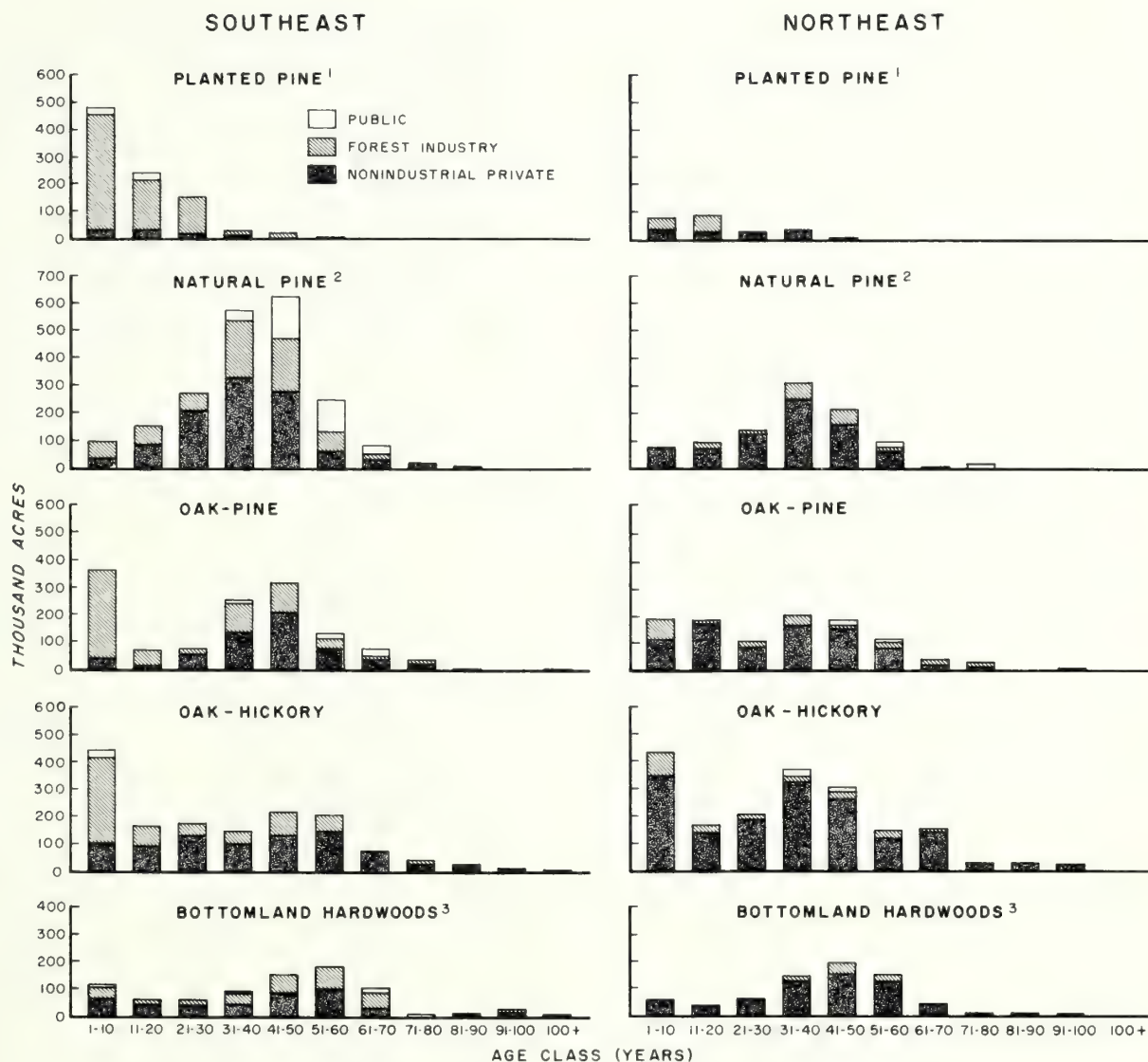
Stand Age

Stand age profiles highlight stand establishment trends and provide insight into future changes in the distribution of forest types (fig. 7). About three-fourths of the pine stands established over the past 10 years are artificial in origin. The increase in pine plantations is apparent on forest industry land in the Southeastern region. Sharp declines in establishment rates for natural pine stands are evident in both survey regions. Currently, more than two-thirds of the natural pine stands are older than 30 years.

Considerably fewer pine stands exist in the faster-growing middle age classes (11–30 years old) than in the past. This shortage will impact softwood growth for 10 to 15 years until newly-established plantations enter older age classes. Conditions on non-industrial land show rapid depletion of pine stands over the past 30 years. The concerns over long-term softwood supply from east Texas forests center on regeneration rates for harvested pine stands and on establishment of new pine stands at levels of the past decade.

Oak-pine stands declined until the past decade when a surge of new stands developed on forest industry land in the Southeast region. Most of these young stands are new pine plantations with considerable hardwood stocking. Such stands represent an opportunity for increasing pine type acreage in the future. Most of this acreage will require some hardwood control measures or replanting to boost pine stocking.

Oak-hickory stands also declined steadily until abrupt increases took place in both survey regions over the past 10 years. Currently, 872.9 thousand acres, or 26 percent, of the oak-hickory stands are in the youngest age class. Of this acreage, only 22 percent was identified as having been planted with pine. Most of the remaining stands are harvested pine and oak-pine stands that lack any pine regeneration.



1 - INCLUDES LONGLEAF-SLASH & LOBLOLLY-SHORTLEAF STANDS SHOWING SIGNS OF ARTIFICIAL ORIGIN.
 2 - INCLUDES LONGLEAF-SLASH & LOBLOLLY-SHORTLEAF STANDS SHOWING NO EVIDENCE OF ARTIFICIAL ORIGIN
 3 - INCLUDES OAK-GUM-CYPRESS & ELM-ASH-COTTONWOOD FOREST TYPES.

Figure 7.—Area of timberland by survey region, forest class, ownership, and stand age class, 1986.

The distribution of bottomland hardwood timberland by age class documents the gradual decline in this type. A bulge exists in the middle age classes, from 30 to 60 years, with very few stands in older age classes.

Stand Size

Forty-nine percent of east Texas' timberland is in sawtimber stands, 24 percent is poletimber, 24 percent is sapling-seedling, and 2 percent is nonstocked (table V). Sawtimber and poletimber stands decreased slightly since 1975. Sapling-seedling stands increased by 11 percent. Although a minor component of the timberland base, the area of nonstocked acreage more than doubled.

Stand-size changes varied by survey region. The Southeast region had decreases in sawtimber (by 11 percent) and poletimber (by 8 percent) along with a large increase in sapling-seedling stands (by 28 percent). These changes reflect an increase in the liquidation of merchantable stands in Southeast

Texas. The Southeast region still has a higher percentage of sawtimber stands than the Northeast region. The Northeast region had increases in sawtimber stands and decreases in both poletimber and sapling-seedling stands.

STAND STRUCTURE

Number of Trees

Shifts in the numbers of live trees between diameter classes at 2-inch intervals indicate that major changes occurred in the structure of east Texas forests in the past 11 years. With the exception of the 2- and 4-inch classes, the number of live softwoods declined in all diameter classes up through the 16-inch class (fig. 8). Increased harvesting of pine resulted in significant declines for softwoods in the 6-inch through the 14-inch classes. Both survey regions had significant declines in this range (McWilliams and Bertelson 1986a and 1986b). The number of live hardwoods decreased in the 2-

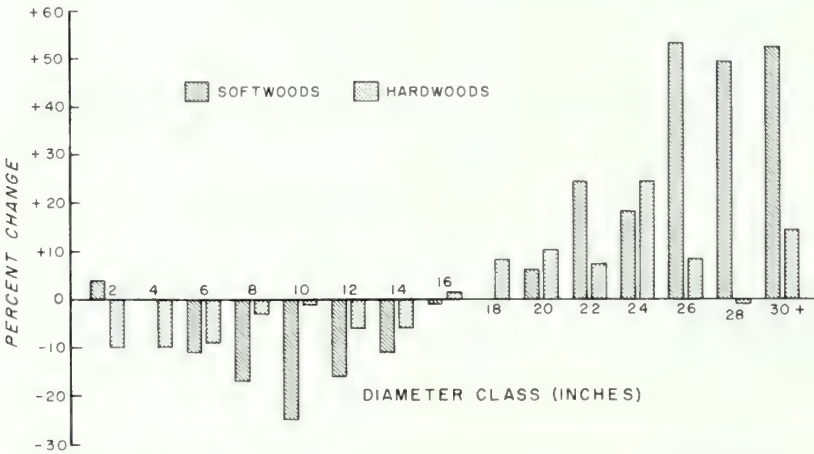


Figure 8.—Change in the number of live trees between 1975 and 1986.

Table V.—Area of timberland and percent change by stand-size class by survey region, east Texas, 1986¹

Survey region	All classes	Sawtimber	Change	Poletimber	Change	Sapling and seedling	Change	Nonstocked	Change
	Thousand acres	Thousand acres	Percent	Thousand acres	Percent	Thousand acres	Percent	Thousand acres	Percent
Southeast	6,666.5	3,550.0	–11	1,327.8	–8	1,647.1	28	141.6	83
Northeast	4,898.8	2,165.0	4	1,485.5	–2	1,131.4	–7	116.9	162
All regions	11,565.3	5,715.1	–6	2,813.3	–5	2,778.5	11	258.5	112

¹Rows and columns may not sum to totals due to rounding.

inch through the 14-inch classes. Increases took place in larger diameters for both species groups with the exception of hardwoods in the 28-inch class, which decreased slightly.

Stocking

Some changes have appeared in the stocking characteristics of east Texas forests (fig. 9). Stocking is assessed by comparing existing stand density to a standard that represents full stocking or 100 percent. The assessment is made in terms of basal area or number of trees (see Definition of Terms section).

Both the area of severely-overstocked (stocked greater than 130 percent with growing-stock trees) and understocked (stocked less than 60 percent with growing-stock trees) stands increased since 1975. The most significant of these changes is the 32 percent increase in understocked stands (an increase of

881.7 thousand acres). More than three-fourths of the increase was in oak-hickory stands. Understocked oak-hickory stands are often the result of partial cuts that remove the merchantable pine component of pine and oak-pine stands. Both the area of moderately-overstocked (stocked 100 to 130 percent with growing-stock trees) and optimally stocked (stocked 60 to 100 percent with growing-stock trees) pine and oak-pine stands underwent decreases.

The area of cull stands totaled 988.2 thousand acres (appendix table 5), compared with the 404.7 thousand acres found in 1975. Cull stands are stands where 60 percent or more of the stocking is comprised of rough and rotten trees. About two-thirds of the cull stands are held by nonindustrial private owners.

Basal Area

The average basal area per acre for east Texas decreased slightly from 81 square feet per acre to 76 square feet (table VI). The basal area per acre of rough and rotten trees increased by 14 percent but was offset by losses in the stocking of growing-stock trees. Changes were most apparent in the oak-pine and oak-hickory forest types. Decreases were especially significant in the Southeast region where cutting levels increased most dramatically since the previous survey.

The distribution of basal area per acre by diameter class for the last two surveys shows that decreases were concentrated on trees less than 15.0-inches d.b.h. (fig. 10). Currently, 76 percent of the basal area per acre is in trees less than 15.0-inches d.b.h.

SPECIES DISTRIBUTION

Tree species are found in varying abundance across east Texas. Figure 11 contains distribution maps for the 4 major southern pine species with each symbol representing 5.0 million cubic feet of growing-stock volume. The maps were constructed at the county level. Some counties containing volume for a particular species may not have any symbols because the 5.0 million cubic foot threshold was not reached.

Loblolly pine is the most widely distributed southern pine species but is most abundant in southern counties. Shortleaf pine is found in most parts of east Texas but is most common in central counties. Longleaf pine volume is concentrated in five counties in southeast Texas—Hardin, Jasper, Newton, Polk, and Tyler. Slash pine is also most common in southeast Texas but has been planted in other areas of the State.

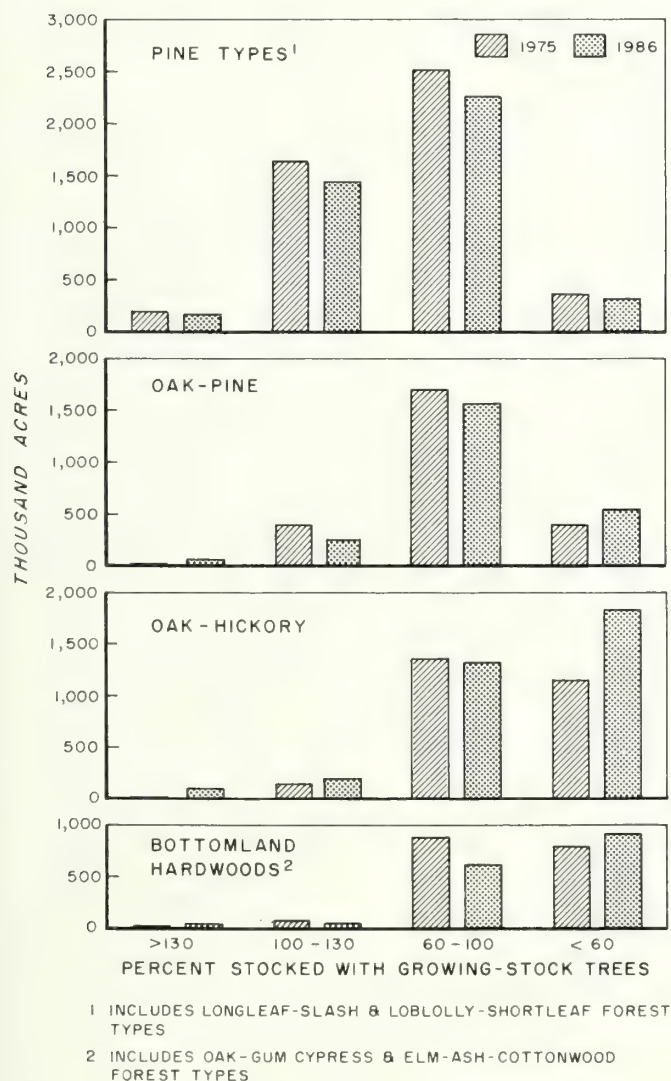


Figure 9.—Area of timberland by forest type, and stocking class, east Texas, 1975 and 1986.

Table VI.—Average basal area per acre of live trees by forest type, east Texas, 1975 and 1986

Species group and forest type	Tree class 1986			Tree class 1975		
	All trees	Growing stock	Rough and rotten	All trees	Growing stock	Rough and rotten
-----Square feet per acre-----						
Softwoods						
Pine types ¹	66.6	62.6	4.0	66.4	63.9	2.5
Oak-pine	29.2	27.4	1.9	32.5	31.4	1.1
Oak-hickory	6.4	5.7	0.6	7.7	7.4	0.3
Bottomland hardwoods ²	5.1	4.6	0.5	4.9	4.3	0.5
All softwoods	32.9	30.8	2.1	36.0	34.6	1.4
Hardwoods						
Pine types ¹	21.4	11.8	9.6	22.2	13.4	8.8
Oak-pine	43.4	25.3	18.1	46.7	30.9	15.8
Oak-hickory	54.2	30.1	24.1	58.8	35.4	23.3
Bottomland hardwoods ²	77.7	45.8	31.9	79.0	49.7	29.4
All hardwoods	43.2	24.6	18.6	44.7	27.9	16.8
Total	76.1	55.4	20.7	80.7	62.5	18.2

¹Includes longleaf-slash and loblolly-shortleaf forest types.

²Includes oak-gum-cypress and elm-ash-cottonwood forest types.

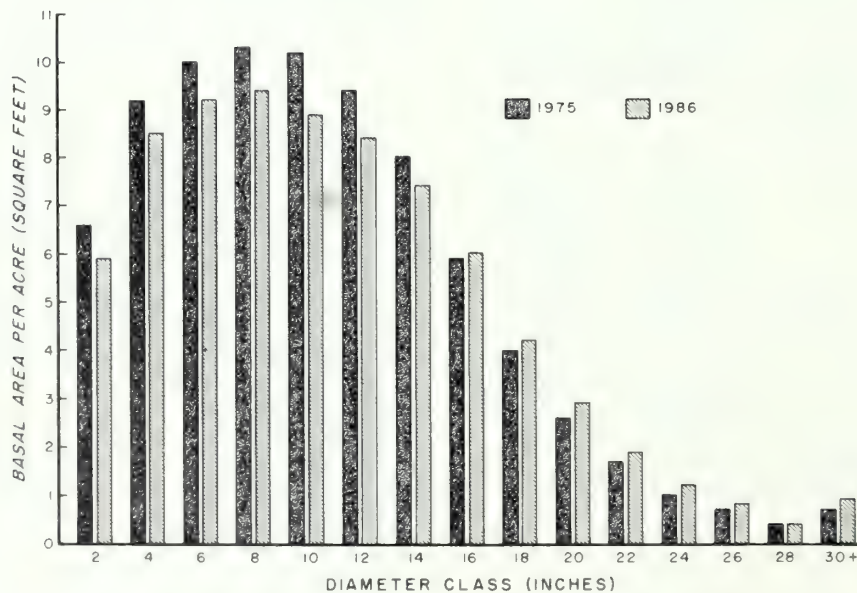


Figure 10.—Basal area per acre by diameter class, 1975 and 1986.

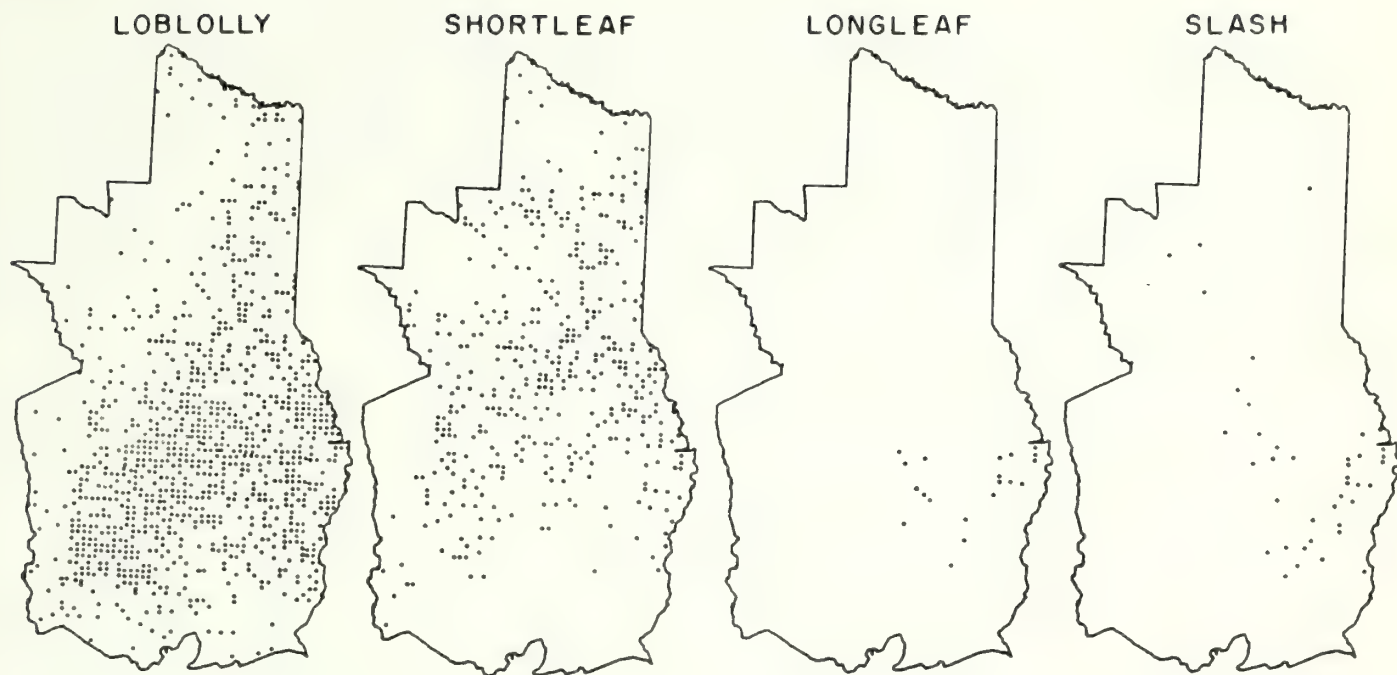


Figure 11.—Distribution of southern pines in east Texas, 1986. Each symbol represents 5,000,000 cubic feet.

Figure 12 depicts distribution maps for the 10 most important hardwood species, in terms of merchantable volume. White and green ash volumes are combined on the same map. Each symbol on these distribution maps represents 1.0 million cubic feet of growing-stock volume.

Sweetgum is by far the most abundant hardwood species throughout east Texas. Water oak is also widely dispersed but at lower concentrations. Post oak is characterized by a wide distribution with slightly higher volumes in western counties. Southern red oak is found in all regions of east Texas, primarily on upland sites. Cherrybark oak is less common than southern red oak and occurs more often on richer bottomland sites. White oak's distribution is skewed toward the somewhat richer soils of the eastern half of the Pineywoods. Willow oak is most common on bottomland sites but also occurs on upland sites (Texas Forest Service 1963), giving this oak an irregular distribution. Blackgum is most common in eastern counties but is also found in some western counties. Both the hickories and white and green ash are distributed sparsely throughout east Texas.

TIMBER VOLUME

The volume of timber on east Texas timberland currently totals 14.2 billion cubic feet, a slight increase of 3 percent since 1975. Timber volume in-

cludes the merchantable sound-wood volume of all live growing-stock trees, rough trees, and rotten trees. Softwood timber volume decreased slightly, by 2 percent, due to a drop in growing-stock volume (fig. 13). Eighty-one percent of the total softwood timber volume is in sawtimber trees, 17 percent in poletimber trees, and 2 percent in rough trees. Hardwood timber volume gained by 10 percent. Forty-three percent of the hardwood timber volume is in sawtimber trees, 30 percent in poletimber trees, 21 percent in rough trees, and 5 percent in rotten trees.

East Texas' growing-stock volume increased by only 2 percent to 12.4 billion cubic feet and is 64 percent softwood and 36 percent hardwood (table VII). Nonindustrial private owners control 60 percent, the largest share of the total. Natural pine stands comprise nearly half of the total inventory.

Softwood Growing Stock

The inventory of softwood growing stock in east Texas is 7.9 billion cubic feet; a decrease of 2 percent since 1975 (table VIII). Although only a minor decrease, this change is important because it is the first decline in this category reported by FIA surveys for east Texas, which date back to 1935. Heavy cutting resulted in a 9 percent drop in softwood inventory in the Southeast region, where two-thirds of the inventory is located. Softwood volume increased by 13 percent in the Northeast region.

The distribution of softwood growing-stock vol-

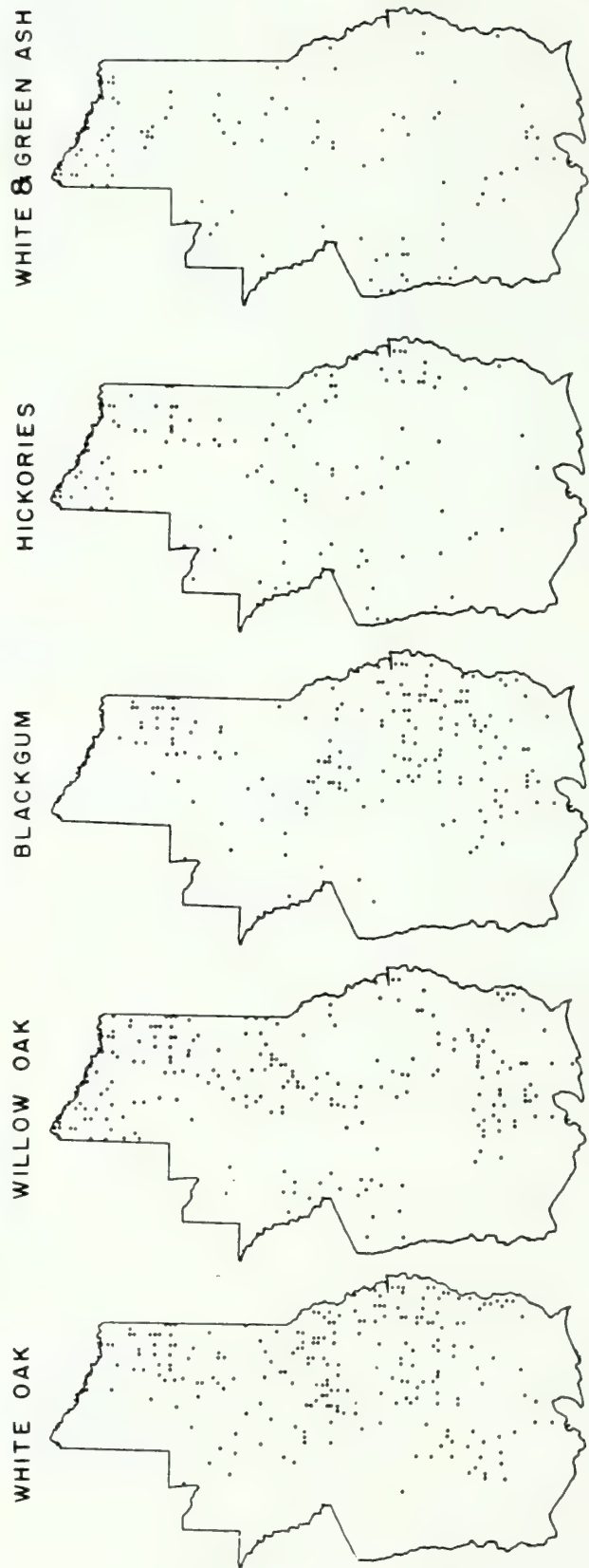
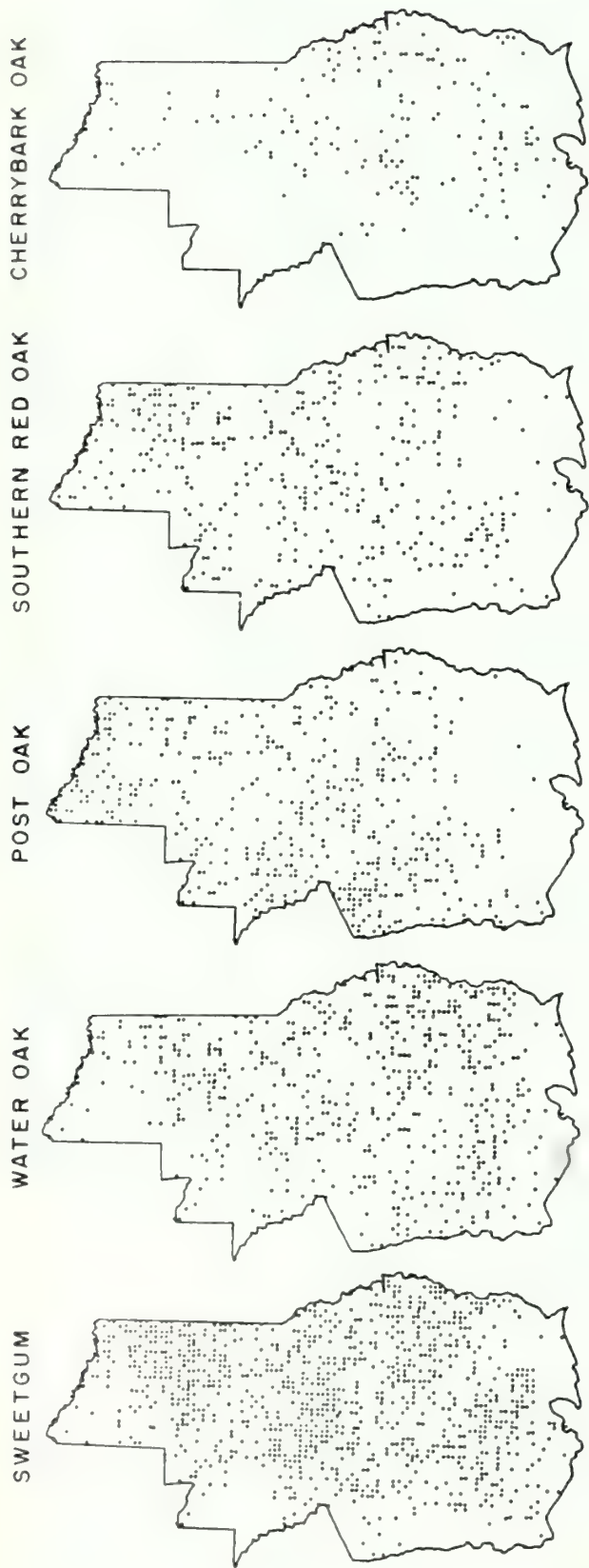


Figure 12.—Distribution of major hardwood species in east Texas, 1986. Each symbol represents 1,000,000 cubic feet.

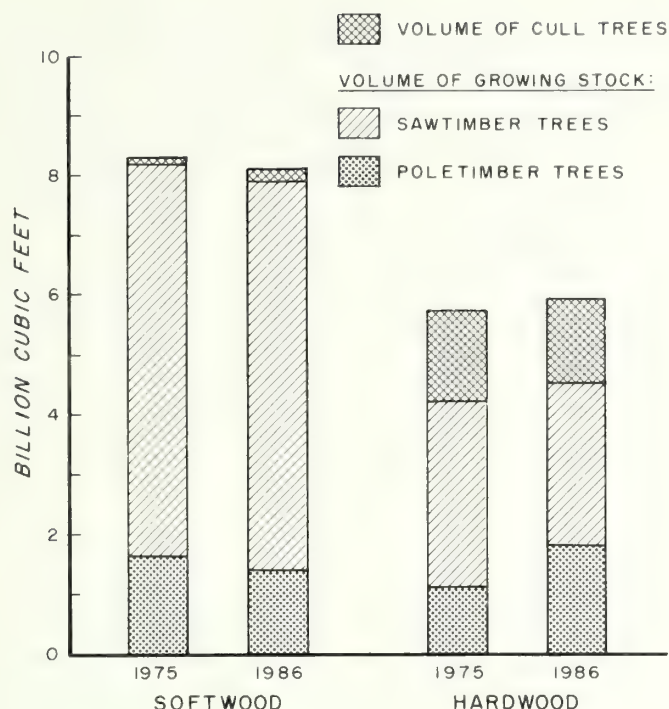


Figure 13.—Volume of timber by species group and class of timber, 1975 and 1986.

ume by diameter class for 1975 and 1986 shows that decreases occurred over a wide range of diameters (fig. 14). The most significant declines were in the 8- to 12-inch classes. Volume increased in the 16-inch and larger classes.

About two-thirds of east Texas' softwood volume is loblolly pine. New stand establishment has offset cutting of loblolly pine; the result is the total loblolly pine inventory remains essentially constant at 5.2 billion cubic feet (fig. 15). The inventory of shortleaf pine declined by 10 percent due to a preference for regenerating cut stands with loblolly pine. However, Texas still has the second highest shortleaf inventory volume of any State (McWilliams and others 1986). Longleaf pine volume dropped by about one-third since 1975 and now accounts for only 1 percent of the softwood inventory. Slash pine and other softwood species increased in volume over the survey period.

Softwood Sawtimber

About three-fourths of east Texas' sawtimber volume is in softwoods. Softwood sawtimber volume increased by 6 percent, and is now 36.7 billion board

Table VII.—Volume of growing stock by ownership, species, and forest class, east Texas, 1986¹

Ownership	Species	Total	Pine plantation ²	Natural pine ³	Oak-pine	Oak-hickory	Bottomland hardwoods ⁴
-----Million cubic feet-----							
Public	Softwood	1,327.1	54.6	1,114.3	133.4	24.9	.....
	Hardwood	285.8	2.6	98.1	77.1	50.9	57.2
	Total	1,612.9	57.2	1,212.4	210.5	75.8	57.2
Forest industry	Softwood	2,276.0	422.0	1,247.4	401.6	112.5	92.5
	Hardwood	1,136.5	21.1	139.1	238.0	298.9	439.3
	Total	3,412.5	443.1	1,386.5	639.6	411.4	531.8
Nonindustrial private	Softwood	4,317.7	210.5	2,767.4	970.9	278.3	90.6
	Hardwood	3,103.7	15.8	342.9	633.6	1,260.1	851.2
	Total	7,421.3	226.3	3,110.3	1,604.5	1,538.4	941.8
All owners	Softwood	7,920.7	687.0	5,129.0	1,506.0	415.6	183.1
	Hardwood	4,526.0	39.5	580.2	948.7	1,609.9	1,347.6
	Total	12,446.7	726.5	5,709.3	2,454.7	2,025.5	1,530.7

¹Rows and columns may not sum to totals due to rounding.

²Includes longleaf-slash and loblolly-shortleaf stands having evidence of artificial origin.

³Includes longleaf-slash and loblolly-shortleaf stands having no evidence of artificial origin.

⁴Includes oak-gum-cypress and elm-ash-cottonwood forest types.

Table VIII.—*Changes in growing-stock volume by survey region, east Texas, 1986*

Survey region	Softwood		Hardwood	
	Volume	Change	Volume	Change
	<i>Million cubic feet</i>	<i>Percent</i>	<i>Million cubic feet</i>	<i>Percent</i>
Southeast	5,243.4	-9	2,352.5	3
Northeast	2,677.3	13	2,173.5	18
All regions	7,920.7	-2	4,526.0	10

Table IX.—*Changes in sawtimber volume by survey region, east Texas, 1986*

Survey region	Softwood		Hardwood	
	Volume	Change	Volume	Change
	<i>Million board feet¹</i>	<i>Percent</i>	<i>Million board feet¹</i>	<i>Percent</i>
Southeast	24,696.9	-4	7,501.6	14
Northeast	12,024.5	35	6,271.0	26
All regions	36,721.4	6	13,772.6	19

¹International 1/4-inch rule.

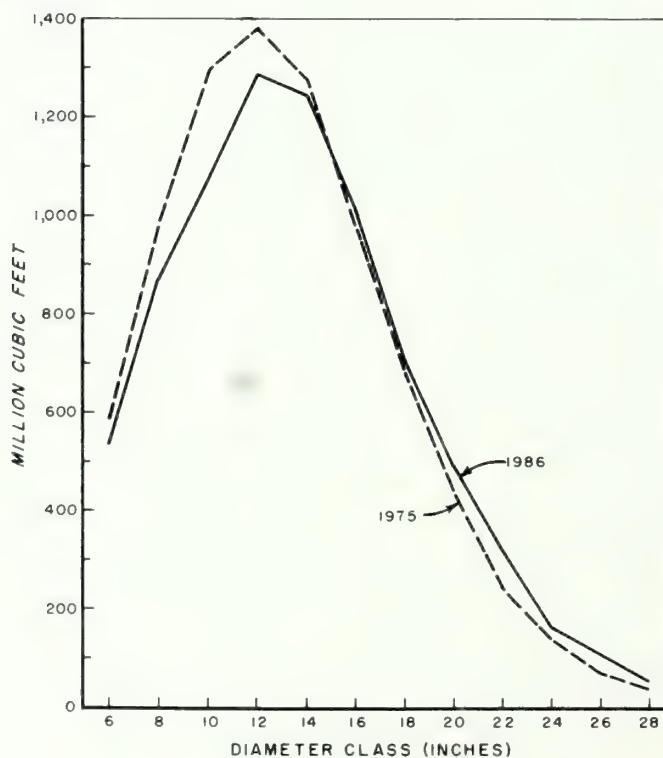


Figure 14.—*Softwood growing-stock volume by diameter class, 1975 and 1986.*

feet (table IX). This contrasts with a 29-percent increase reported in the previous survey. The Southeast region dominates the softwood sawtimber inventory and had a 4 percent decrease since 1975. This decrease was countered by a 35 percent increase in softwood sawtimber volume in the Northeast region.

The distribution of timberland by sawtimber volume per acre indicates a shift towards stands with less than 1,500 board feet per acre (table X). A 30-percent increase in pine stands with more than 5,000 board feet per acre on nonindustrial private timberland signals increased susceptibility to Southern Pine Beetle outbreaks should they occur in the future.

Hardwood Growing Stock

The hardwood growing-stock inventory rose by 10 percent; the present total is 4.5 billion cubic feet. The total hardwood inventory is split about equally between the two survey regions. The Southeast region had a 3-percent increase in hardwood growing stock and the Northeast had an 18-percent increase. These increases are similar in magnitude to those reported in 1975. Increased volumes showed up across all diameter classes except the 6-inch class, which had a slight decline (fig. 16).

The hardwood growing-stock inventory is dominated by other red oaks (30 percent of the total), sweetgum (22 percent), and other white oaks (13 percent). Most hardwood species and species-groups underwent slight increases in volume (fig. 17). Sweetgum volume increased the most with a 23-percent rise. The only species with declining volumes were hickories, which dropped by 18 percent.

Hardwood Sawtimber

Hardwood sawtimber currently totals 13.8 billion board feet and increased by 19 percent since 1975. The Southeast region had a 14-percent increase in hardwood sawtimber, compared to a 26-percent increase in the Northeast region. Nearly half the hardwood sawtimber is mixed with pines on upland sites. Thirty-nine percent of the hardwood sawtimber is on bottomland sites with the rest in pure hardwood stands on upland sites.

Table X.—Area of pine-type timberland¹ and percent change by ownership, and stand volume class, 1975 and 1986

Ownership and stand volume per acre ²	1975	1986	Percent change
-----Thousand acres-----			
Public			
Less than 1,500	29.4	60.6	106
1,500 to 5,000	48.0	39.4	-18
More than 5,000	495.4	389.4	-21
Forest industry			
Less than 1,500	403.1	808.7	101
1,500 to 5,000	620.7	250.8	-60
More than 5,000	783.3	624.7	-20
Nonindustrial private			
Less than 1,500	551.7	375.2	-32
1,500 to 5,000	799.3	536.5	-33
More than 5,000	873.3	1,131.3	30
All owners			
Less than 1,500	984.1	1,244.5	26
1,500 to 5,000	1,468.0	826.7	-44
More than 5,000	2,152.1	2,145.3	0

¹Includes longleaf-slash and loblolly-shortleaf forest types.

²International 1/4-inch rule.

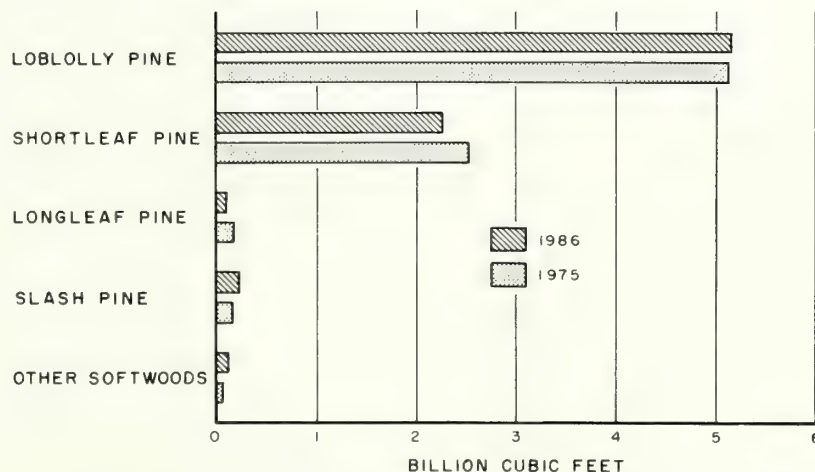


Figure 15.—Softwood growing-stock volume by species, 1975 and 1986.

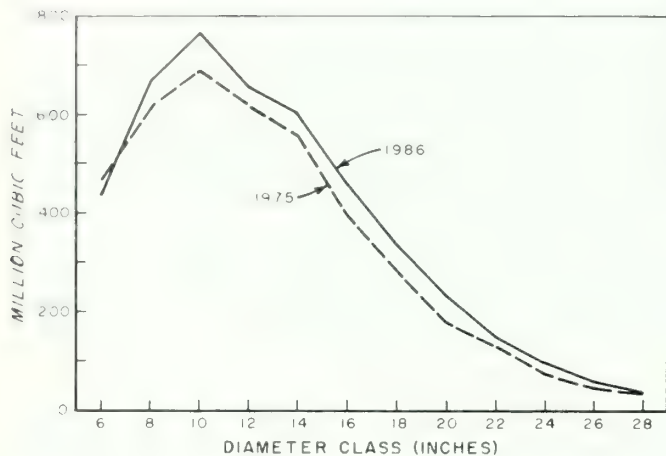


Figure 16.—Hardwood growing-stock volume by diameter class, 1975 and 1986.

BIOMASS

The total weight of woody biomass on east Texas timberland is 451.4 million dry tons, of which 58 percent is hardwood and 42 percent is softwood (table XI). Woody biomass includes the total weight of entire trees at least 1.0-inches d.b.h. This includes the merchantable bole, unmerchantable sections, limbs, and crown material, but does not include foliage, fruits, stumps, or roots. Biomass has become an increasingly important measure over the past decade as wood has begun to compete with petroleum products as a source of energy.

Total woody biomass is divided into merchantable and residual components. Merchantable biomass includes the bole portion of growing-stock trees and comprises 56 percent of the total biomass. More than half of the merchantable biomass (75 percent) is softwood material. Residual biomass includes crowns and limbs of growing-stock trees, saplings, noncommercial species, rough trees, and rotten trees. Hardwoods dominate residual biomass with about three-fourths of the total.

Woody biomass per acre averaged 16 tons of softwood and 23 tons of hardwood or a total of 39 tons. Publicly-owned timberland had the highest weight per acre with 59 tons (39 tons of softwood and 20 tons of hardwood). Heavy concentrations of softwood biomass are found in older natural pine stands on public timberland (table XII). Nonindustrial private owners had the second highest biomass per acre with 41 tons. Nearly two-thirds of their per acre weight was hardwood. Forest industry had the lowest biomass per acre with 32 tons.

Woody biomass is a useful criteria for evaluating the relative importance of species sampled in east

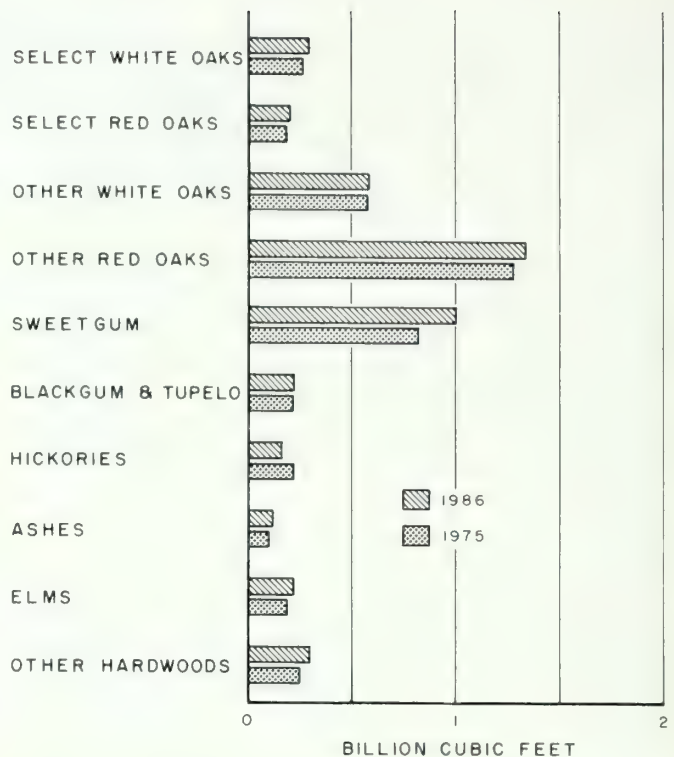


Figure 17.—Hardwood growing-stock volume by species, 1975 and 1986.

Texas. Table XIII shows the ranking of species using biomass as the importance value. Loblolly is by far the dominant species in the Southeast region and shares dominance with shortleaf pine in the Northeast region. Statewide, the five highest ranking species account for 61 percent of the total biomass.

GROWTH, REMOVALS, AND MORTALITY

The FIA defines gross growth as the sum of six components: (1) survivor growth—the increase in net volume of growing-stock trees; (2) ingrowth—the net volume of growing-stock trees that grew to merchantable size (5.0-inches d.b.h.) since the previous inventory and includes growth since attaining merchantable size; (3) growth on removals—the increase in net volume of trees that were cut since the previous inventory; (4) growth on mortality—the increase in net volume of trees in the previous inventory until they die; (5) cull increment—the net volume of trees that changed from growing stock to rough or rotten since the previous inventory, minus the net volume of trees that changed from rough or rotten to growing stock; and (6) mortality—the net volume of trees in the previous inventory that have died (table XIV). Only trees currently of merchantable size are included in growth estimates. Net growth is defined as gross growth minus mortality.

Table XI.—*Total dry weight, merchantable dry weight, and residual dry weight of all live tree woody biomass sampled on timberland by species, and survey region, east Texas, 1986¹*

Survey region	Species	Total dry weight	Merchantable dry weight	Residual dry weight
-----Thousand tons-----				
Southeast	Softwood	123,649.4	94,522.4	29,127.1
	Hardwood	131,290.0	55,856.1	75,433.7
	Total	254,939.6	150,378.5	104,560.9
Northeast	Softwood	65,136.0	49,150.6	15,985.4
	Hardwood	131,328.4	55,298.8	76,029.7
	Total	196,464.6	104,449.4	92,015.1
All regions	Softwood	188,785.4	143,673.0	45,112.5
	Hardwood	262,618.4	111,155.0	151,463.5
	Total	451,404.1	254,828.1	196,576.1

¹Rows and columns may not sum to totals due to rounding.

Table XII.—*Total dry weight of all live tree woody biomass sampled on timberland by ownership, species, and forest class, east Texas, 1986¹*

Ownership	Species	Total	Pine plantation ²	Natural pine ³	Oak-pine	Oak-hickory	Bottomland hardwoods ⁴
-----Thousand tons-----							
Public	Softwood	29,453.6	1,724.4	24,217.5	2,978.6	533.2	.....
	Hardwood	15,448.7	209.7	5,817.0	3,759.4	2,841.6	2,821.0
	Total	44,902.3	1,934.1	30,034.5	6,738.1	3,374.7	2,821.0
Forest industry	Softwood	56,424.4	13,564.6	28,774.9	9,455.0	2,598.8	2,031.0
	Hardwood	64,358.1	1,901.8	9,640.4	13,838.0	16,262.7	22,715.2
	Total	120,782.6	15,466.5	38,415.4	23,292.9	18,861.6	24,746.2
Nonindustrial private	Softwood	102,907.4	5,602.9	65,345.7	22,991.8	6,921.5	2,045.5
	Hardwood	182,811.6	1,321.5	22,631.2	36,516.5	75,339.5	47,002.9
	Total	285,719.1	6,924.4	87,976.9	59,508.3	82,261.1	49,048.4
All owners	Softwood	188,785.4	20,891.9	118,338.1	35,425.4	10,053.5	4,076.5
	Hardwood	262,618.4	3,433.0	38,088.7	54,113.9	94,443.8	72,539.1
	Total	451,404.1	24,325.0	156,426.8	89,539.3	104,497.4	76,615.6

¹Rows and columns may not sum to totals due to rounding.

²Includes longleaf-slash and loblolly-shortleaf stands having evidence of artificial origin.

³Includes longleaf-slash and loblolly-shortleaf stands having no evidence of artificial origin.

⁴Includes oak-gum-cypress and elm-ash-cottonwood forest types.

Published growth statistics are periodic annual averages for the inter-survey period. Another term related to growth is net change, which is defined as net growth minus removals.

Some improvements in the calculation of growth were added since the 1975 survey of east Texas forests. The current system has included refinements in the processing of nongrowth and ongrowth trees. Nongrowth trees are merchantable tally trees that were merchantable and not sampled in the previous survey (Van Deusen and others 1986). Nongrowth trees are included in survivor growth. On-growth trees are merchantable tally trees that were

submerchantable and not sampled in the previous survey. Ongrowth trees are included with the ingrowth component (Van Deusen and others 1986). Another change involved the rate at which mortality trees grow from the time of previous measurement up until the time of death. The old method calculated growth on mortality trees using half of the rate measured during the previous survey. The current method uses the full rate of growth up until death. Another change was the inclusion of cull increment in the growth equation.

The method of computing removals has also changed since the last survey. Previously, removals

Table XIII.—*Ranking of species importance by total tree dry weight, and survey unit, east Texas, 1986¹*

East Texas			Southeast region			Northeast region		
Rank	Species	Dry weight	Rank	Species	Dry weight	Rank	Species	Dry weight
		<i>Thousand tons</i>			<i>Thousand tons</i>			<i>Thousand tons</i>
1	Loblolly pine	125,658.7	1	Loblolly pine	92,801.7	1	Loblolly pine	32,857.0
2	Shortleaf pine	50,175.6	2	Shortleaf pine	20,707.3	2	Shortleaf pine	29,468.3
3	Sweetgum	37,996.5	3	Water oak	18,908.5	3	Sweetgum	19,482.2
4	Post oak	32,611.9	4	Sweetgum	18,514.3	4	Post oak	18,711.5
5	Water oak	30,423.2	5	Post oak	13,900.4	5	Southern red oak	14,456.6
6	Southern red oak	24,713.7	6	Southern red oak	10,257.0	6	Water oak	11,514.7
7	Willow oak	13,559.6	7	Cherrybark oak	6,213.6	7	Willow oak	8,018.6
8	White oak	12,547.5	8	Blackgum	5,912.5	8	Hickories	6,839.7
9	Hickories	10,599.6	9	White oak	5,860.5	9	White oak	6,687.0
10	Cherrybark oak	9,826.0	10	Slash pine	5,742.0	10	Winged-elm	4,359.2
11	Blackgum	9,419.9	11	Willow oak	5,541.1	11	Overcup oak	4,145.1
12	Winged elm	7,363.0	12	Laurel oak	4,681.4	12	Cherrybark oak	3,612.4
13	Slash pine	6,876.8	13	Hickories	3,759.8	13	Green ash	3,542.2
14	Overcup oak	5,859.2	14	Winged elm	3,003.8	14	Blackgum	3,507.4
15	Green ash	5,717.0	15	Longleaf pine	2,971.4	15	Sugarberry	2,958.1
16	Sugarberry	5,243.5	16	Sugarberry	2,285.5	16	Blackjack oak	2,574.6
17	Laurel oak	4,766.3	17	Swamp chestnut oak	2,270.0	17	Red maple	1,704.9
18	Red maple	3,961.3	18	Red maple	2,256.4	18	American hornbeam	1,446.0
19	Blackjack oak	3,639.4	19	American beech	2,239.0	19	White ash	1,442.2
20	American hornbeam	3,545.1	20	Green ash	2,174.9	20	Cedar elm	1,333.1
21	Longleaf pine	2,971.4	21	American hornbeam	2,099.1	21	American elm	1,316.4
22	White ash	2,854.8	22	Water tupelo	1,815.6	22	River birch	1,271.6
23	American elm	2,455.7	23	Overcup oak	1,714.1	23	Slash pine	1,134.8
24	American beech	2,444.4	24	White ash	1,412.6	24	Black oak	1,119.7
25	Swamp chestnut oak	2,283.5	25	Water hickory	1,345.0	25	Flowering dogwood	1,083.1
26	Cedar elm	2,180.2	26	Eastern hophornbeam	1,243.0	26	Baldcypress	1,038.0
27	Eastern hophornbeam	2,126.1	27	American holly	1,174.6	27	Eastern hophornbeam	883.1
28	Water hickory	2,045.4	28	American elm	1,139.3	28	Cottonwood	834.7
29	Baldcypress	1,927.8	29	Blackjack oak	1,064.9	29	Bluejack oak	734.8
30	Flowering dogwood	1,913.8	30	Sweetbay	1,061.4	30	Water hickory	700.4
31	Water tupelo	1,822.0	31	Hawthorns	953.8	31	Eastern redcedar	637.2
32	River birch	1,571.6	32	Baldcypress	889.8	32	Hawthorns	592.2
33	Hawthorns	1,546.1	33	Cedar elm	847.1	33	Shumard oak	580.8
34	Black oak	1,328.9	34	Flowering dogwood	830.7	34	Sassafras	567.7
35	American holly	1,314.3	35	Sycamore	683.2	35	Slippery elm	539.4
36	Eastern redcedar	1,174.5	36	Southern magnolia	591.1	36	Common persimmon	467.3
37	Sweetbay	1,106.5	37	Nuttall oak	579.1	37	Honey locust	459.4
38	Shumard oak	1,038.2	38	Eastern redcedar	537.3	38	Willows	360.8
39	Bluejack oak	922.5	39	Shumard oak	457.4	39	Water-elm	342.6
40	Sassafras	890.8	40	Slippery elm	331.2	40	Red mulberry	294.2
41	Cottonwood	880.3	41	Tree sparkleberry	328.9	41	Black cherry	267.0
42	Slippery elm	870.7	42	Sassafras	323.1	42	Cherry, plum	220.7
43	Sycamore	779.8	43	Pecan	303.2	43	Osage-orange	215.9
44	Common persimmon	724.1	44	River birch	300.0	44	Black walnut	210.5
45	Nuttall oak	638.1	45	Redbay	272.7	45	American beech	205.4
46	Honey locust	631.5	46	Common persimmon	256.8	46	Eastern redbud	198.5
47	Southern magnolia	601.5	47	Black oak	209.2	47	Florida maple	179.8
48	Willows	489.9	48	Bluejack oak	187.7	48	Boxelder	169.5
49	Water-elm	472.7	49	Honey locust	172.1	49	Pecan	169.2
50	Pecan	472.4	50	Black cherry	157.6	50	American holly	139.7
51	Black cherry	424.5	51	Cherry, plum	137.8	51	Water locust	131.1
52	Tree sparkleberry	412.3	52	Water-elm	130.1	52	Sycamore	96.6
53	Red mulberry	400.1	53	Willows	129.1	53	Laurel oak	84.9
54	Cherry, plum	358.5	54	Red mulberry	105.9	54	Tree sparkleberry	83.5
55	Osage-orange	307.8	55	Osage-orange	91.9	55	Nuttall oak	58.9
56	Black walnut	292.6	56	American basswood	89.7	56	Bumelia	52.8
57	Eastern redbud	281.9	57	Water locust	88.6	57	American basswood	52.6
58	Redbay	272.7	58	Eastern redbud	83.4	58	Sweetbay	45.1
59	Florida maple	249.6	59	Black walnut	82.1	59	Chinkapin	39.8

Table XIII.—*Ranking of species importance by total tree dry weight, and survey unit, east Texas, 1986¹—Continued*

East Texas			Southeast region			Northeast region		
Rank	Species	Dry weight	Rank	Species	Dry weight	Rank	Species	Dry weight
		<i>Thousand tons</i>			<i>Thousand tons</i>			<i>Thousand tons</i>
60	Water locust	219.7	60	Bumelia	74.6	60	Hackberry	21.8
61	Boxelder	170.2	61	Florida maple	69.8	61	Chinkapin oak	20.6
62	American basswood	142.3	62	Live oak	56.6	62	Swamp white oak	18.0
63	Bumelia	127.4	63	Cottonwood	45.6	63	Bur oak	17.2
64	Live oak	56.6	64	Allegheny chinkapin	41.3	64	Chinaberry	15.7
65	Chinkapin	45.6	65	Sugar maple	25.9	65	Sourwood	14.4
66	Allegheny chinkapin	41.3	66	Scarlet oak	13.4	66	Swamp chestnut oak	13.5
67	Hackberry	30.6	67	Bur oak	13.2	67	Silver maple	10.6
68	Bur oak	30.4	68	Sourwood	12.4	68	Southern magnolia	10.4
69	Sugar maple	30.3	69	Silver maple	11.4		Miscellaneous ²	82.0
70	Sourwood	26.8	70	Siberian elm	10.8			
71	Chinaberry	23.2		Miscellaneous ²	342.9			
72	Silver maple	22.0						
73	Chinkapin oak	20.6						
74	Swamp white oak	18.0						
75	Scarlet oak	13.4						
76	Siberian elm	12.8						
	Miscellaneous ²	389.3						

¹Includes all live trees at least 1.0-inches d.b.h. sampled on timberland.²Includes species with less than 10.0 thousand tons and some miscellaneous noncommercial species.Table XIV.—*Components of annual change in the volume of growing stock by species group, and survey region, east Texas, 1975–1986¹*

		Growth component								
Survey region	Species	Survivor growth	Ingrowth	Growth on removals	Growth on mortality	Cull increment	Mortality	Timberland removals	Land-clearing removals	Net change
-----Million cubic feet-----										
Southeast	Softwood	204.8	30.6	76.4	13.8	-2.1	-43.6	-292.7	-21.6	-34.4
	Hardwood	74.0	12.7	13.9	4.9	-4.7	-23.0	-57.1	-12.4	8.3
	Total	278.8	43.3	90.3	18.7	-6.8	-66.6	-349.8	-34.0	-26.1
Northeast	Softwood	129.0	13.0	49.9	4.3	-0.3	-12.7	-150.0	-14.9	18.3
	Hardwood	83.0	12.8	11.0	4.2	-7.8	-17.3	-46.1	-17.2	22.6
	Total	212.0	25.8	60.9	8.5	-8.1	-30.1	-196.1	-32.0	40.9
All regions	Softwood	333.9	43.6	126.4	18.1	-2.4	-56.3	-442.7	-36.5	-15.9
	Hardwood	156.9	25.5	24.9	9.1	-12.4	-40.3	-103.2	-29.5	31.0
	Total	490.8	69.1	151.3	27.2	-14.8	-96.7	-545.9	-66.0	15.0

¹Rows and columns may not sum to totals due to rounding.

were based on a 100 percent canvass of wood-using industries processing timber from the State for the single year prior to the survey. The current method estimates removals directly from FIA field plots and is computed as a periodic average for the inter-survey period. The new method yields an estimate of removals that is consistent with published growth statistics and is more representative of removals over the entire inter-survey period.

Due to the changes in computations, new estimates of growth and removals were made for 1975 using current standards and procedures. All comparisons made with the prior survey results, in this report, use the recomputed statistics. The recomputed data was not available for survey unit reports that were published previously (McWilliams and Bertelson 1986a and 1986b).

Total gross growth of the east Texas forest was 723.6 million cubic feet per year, a decrease of 5 percent since 1975. A more significant decrease of 12 percent was evident for net growth. The larger decline for net growth was due to a sharp increase in mortality, which more than doubled. Any finding of decreased growth in east Texas is significant because earlier surveys have reported large gains. Also, growth is a very important component of the equation for net change in inventory.

Removals, also a critical component of net change, underwent a 43-percent increase between 1975 and 1985. The result of decreased growth and increased removals was a very small positive net change in inventory. A net decrease of 15.9 million cubic feet per year in the Southeast region was offset by a net increase of 31.0 million cubic feet per year in the Northeast region.

The ratio of growth-to-removals is one measure of a forest's capacity to expand or decline in volume. Ratios greater than 1.0:1.0 imply increases and ratios less than 1.0:1.0 signal decreases. The ratio of net growth-to-removals in 1975 was 1.7:1.0. The current ratio is 1.0:1.0, suggesting that net growth is balanced by removals, at least for the short-term future. Local regions that are below a ratio of 1.0:1.0 will experience increasing timber scarcity.

Softwood Growing Stock

Softwoods have by far the largest impact on overall growth and removals in east Texas, contributing 74 percent of the total net growth and 78 percent of removals. Changes in growth, removals, and mortality of softwoods were very similar to those for both softwoods and hardwoods combined. Gross growth of softwoods totaled 519.5 million cubic feet per year, a decrease of 4 percent (fig. 18). Mortality more than doubled, causing net growth to drop by 10 percent to 463.2 million cubic feet per year. Net

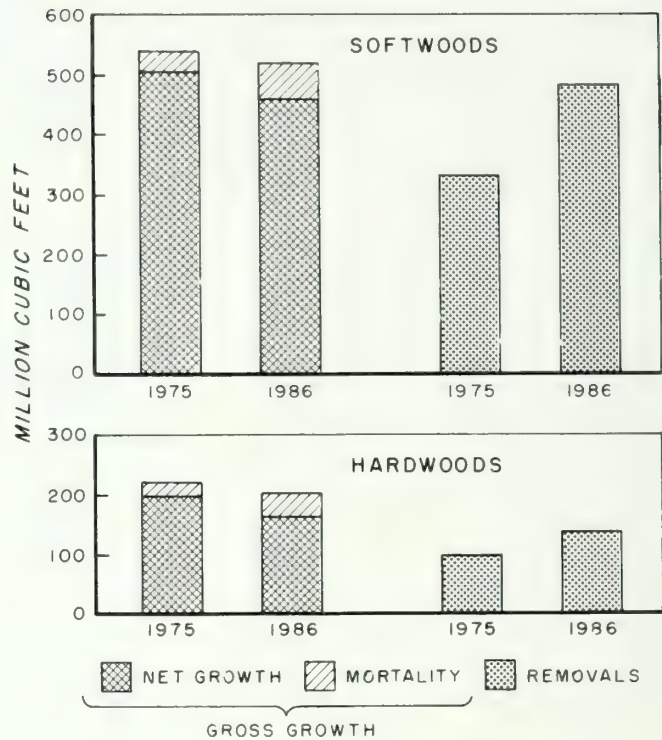


Figure 18.—Average net annual growth, average annual mortality, and average annual removals of growing stock, 1975 and 1986.

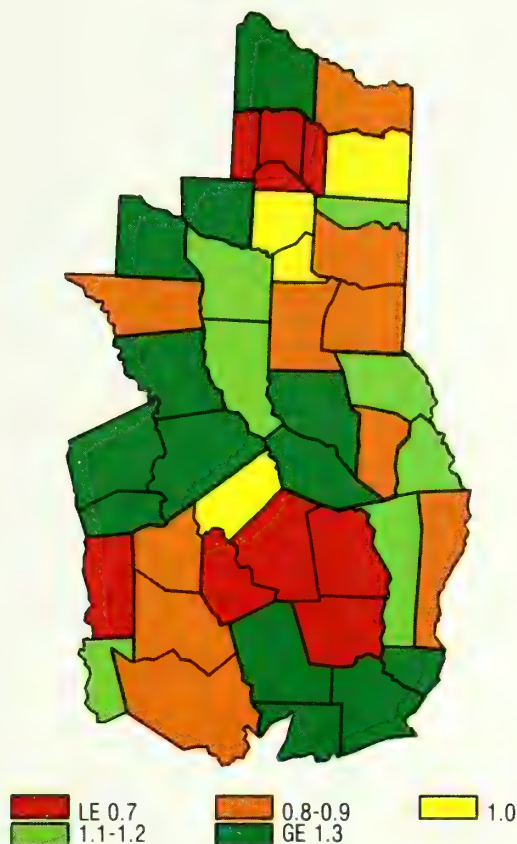
growth decreased by 14 percent in the Southeast region and remained the same in the Northeast region. Removals are now 479.2 million cubic feet per year, an increase of 45 percent overall. The Southeast region had the largest increase in removals with 38 percent.

The softwood growth-to-removals ratio was 1.0:1.0 for both regions combined; the ratio was down from 1.5:1.0 in 1975. The ratio was 0.9:1.0 for the Southeast region and 1.1:1.0 for the Northeast region. Figure 19 depicts the softwood growth-to-removal relationships for east Texas counties. Of the 43 counties surveyed, 19 had ratios less than 1.0:1.0 and 4 had ratios of 1.0:1.0. The heaviest drain is taking place on forest industry land where the ratio is now 0.7:1.0; this compares with a ratio of 1.2:1.0 reported in 1975.

The current growth situation has caused concern regarding future supplies of softwood timber. There is no simple explanation of declining softwood growth because many forces are affecting the resource simultaneously. Both natural and man-related factors are involved; however, the effects of man's activity are clearly a dominant force.

A variety of circumstances have impacted forest industry since the last survey in 1975, including the general recession of the early 1980's, Canadian imports, new tax laws, a strong American dollar, and increased corporate mergers (Neal and Norris 1987).

SOFTWOOD



HARDWOOD

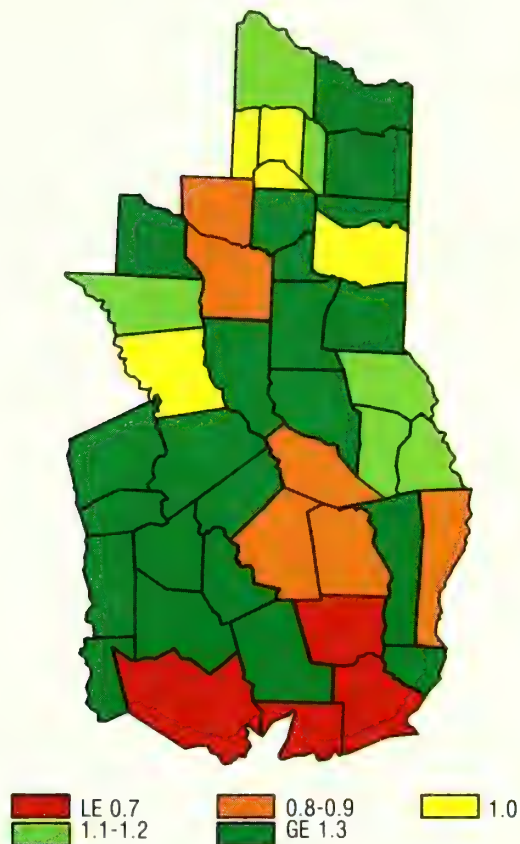


Figure 19.—Softwood and hardwood growing-stock growth-to-removals ratio by county, 1986.

One effect of these trends has been an increase in the harvest of mature pine stands as firms seek to remain liquid and ease cash-flow shortages. Also, considerable efforts have been undertaken to convert mixed stands and hardwood stands growing on upland pine sites to pine plantations. During the same time period, the pulp and paper industry continued its history of expansion albeit at a slower rate. The result of these trends has been increased harvesting of both fast-growing, middle-aged stands and older stands with high levels of accretion, which has had a major impact on aggregate growth.

The regeneration of harvested stands has been an important factor affecting growth. Nonindustrial private owners hold considerable acreage that lacks adequate pine regeneration (see Timberland Disturbance section). Forest industry also has a substantial area of timberland with poor regeneration, but much of this acreage consists of recently harvested stands that may be scheduled for future planting.

The decrease in pine type timberland has had a negative impact on growth. Harvesting and regeneration activities are a major cause of the decrease,

but land-use change is also a factor. While the total area of timberland changed very little, substantial shifting took place between timberland, agriculture, urban, and other uses. Land entering the timberland base is often comprised of poorly-stocked young stands on reverting agricultural land, while departing timberland often supports mature stands.

Natural forces are also affecting the softwood resource. The combined forces of natural aging in some stands and increased mortality have had a negative impact on net growth. Many existing natural pine stands that were established during the 1940's and 1950's are maturing. Southern Pine Beetle has been a major cause of mortality since the last survey. Major beetle outbreaks occurred in 1976, 1985, and 1986. Other insects, disease, weather, and fire have also taken their toll.

The current softwood growth decline is expected to be relatively short-lived. Future increases in softwood ingrowth from the extensive area of young pine stands should cause growth to rise rapidly over the next 10 to 15 years. A continued investment in pine stand establishment will be required to sustain future increases in growth.

Softwood Sawtimber

Gross growth of softwood sawtimber was 2,550.6 million board feet per year (table XV). Mortality of softwood sawtimber more than doubled, resulting in essentially constant net growth of softwood sawtimber (fig. 20). Net growth of softwood sawtimber decreased by 10 percent in the Southeast region and increased by 22 percent in the Northeast region. Softwood sawtimber removals increased by 45 percent. The increase was more noteworthy in the Northeast region where removals increased by 60 percent over 1975 levels.

Hardwood Growing Stock

The gross growth of hardwood growing stock is now 203.9 million cubic feet per year, a decrease of 7 percent. A doubling of hardwood mortality resulted in an 18 percent decline in the net growth of hardwoods. The current net growth of hardwoods is 163.6 million cubic feet per year. The decrease in net growth was more apparent in the Southeast region. Decreases in hardwood growth took place along with a 39 percent increase in hardwood removals for the 2 regions combined. Removals now average 132.8 million cubic feet per year. The largest percentage increase in removals was in the Northeast region.

The overall growth-to-removals ratio for hardwoods is 1.2:1.0 compared to 2.1:1.0 in 1975. The ratios for the Southeast and Northeast regions are 1.1:1.0 and 1.4:1.0 respectively. Ten counties had ratios less than 1.0:1.0 and 5 had ratios of 1.0:1.0.

The downturn in hardwood growth signals the need for improving the overall structure and composition of the hardwood resource in the future. Fortunately, growth still exceeds removals. However,

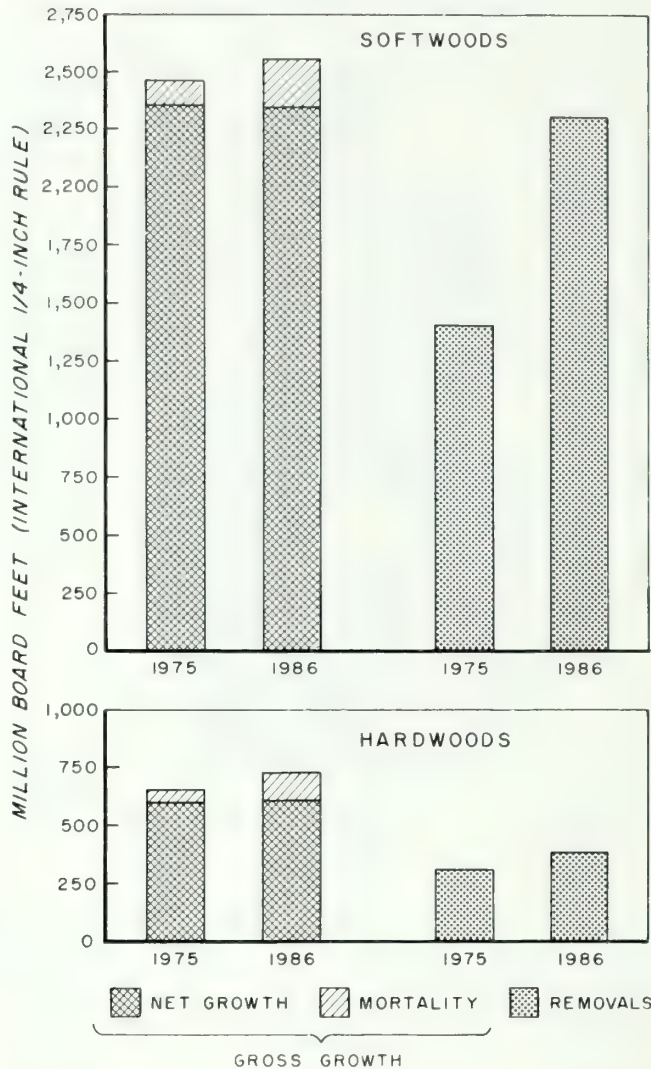


Figure 20.—Average net annual growth, average annual mortality, and average annual removals of sawtimber, 1975 and 1986.

Table XV.—Components of annual change in the volume of sawtimber by species group, and survey region, east Texas, 1975–1986¹

		Growth component								
Survey region	Species	Survivor growth	Ingrowth	Growth on removals	Growth on mortality	Cull increment	Mortality	Timberland removals	Land-clearing removals	Net change
-----Million board feet ² -----										
Southeast	Softwood	910.2	312.4	312.8	50.1	-2.5	-158.7	-1,344.0	-89.9	-9.6
	Hardwood	221.7	109.2	30.7	15.9	-7.1	-73.5	-156.8	-30.9	109.2
	Total	1,131.9	421.6	343.5	66.0	-9.6	-232.2	-1,500.8	-120.8	99.6
Northeast	Softwood	560.9	190.5	199.3	13.8	3.1	-37.2	-570.6	-52.5	307.3
	Hardwood	212.7	125.4	23.3	8.4	-18.4	-40.8	-134.9	-47.9	127.8
	Total	773.6	315.9	222.6	22.2	-15.3	-77.9	-705.5	-100.4	435.2
All regions	Softwood	1,471.1	503.0	512.0	63.9	0.6	-195.9	-1,914.7	-142.4	297.6
	Hardwood	434.4	234.6	54.0	24.3	-25.6	-114.2	-291.7	-78.8	237.0
	Total	1,905.5	737.6	566.0	88.2	-25.0	-310.1	-2,206.4	-221.2	534.6

¹Rows and columns may not sum to totals due to rounding.
²International 1/4-inch rule.

if hardwood removals continue to increase at the same rate as in recent years, declines in inventory will show up, especially for local regions.

As is the case with softwoods, the decrease in hardwood growth has arisen due to several inter-related factors. Perhaps the most significant factors causing the downturn have been the sharp increases in removals and gradual decline in the area of mature hardwood stands.

Increased use of hardwoods for unbleached kraft products has put a strain on the inventory of fast-growing small diameter hardwoods. The stock of larger-sized trees is under pressure from selective cutting practices that tend to remove the best trees. The result of removing small trees and larger, quality trees has been a residual stand that is characterized by slower growth than in the past.

The area of mature hardwood stands has declined steadily in recent decades. The increase in the oak-hickory type of the past decade resulted from dramatic increases in young stands (10 years old or younger). Most of these stands are harvested pine and oak-pine stands where hardwoods dominate pines. Many of these stands will convert to pine stands in coming years. Conversion of mature hardwood stands to pine on sites capable of growing pines has also been a factor. Lastly, the ongoing demise of bottomland hardwood forests has been documented in all the past surveys of east Texas.

Hardwood Sawtimber

Gross growth of hardwood sawtimber, now 721.7 million board feet per year, is up by 11 percent. Net growth of hardwood sawtimber increased only slightly due to a 119 percent increase in mortality. Hardwood sawtimber removals increased by 28 percent.

TIMBERLAND DISTURBANCE

Roughly half of the timberland in east Texas showed evidence of some type of harvesting or management disturbance since the previous survey (table XVI). Disturbance is primarily cutting, but excludes stands where a few trees were removed for firewood or other use, and timberland that was diverted to other uses. Two-thirds of forest industry timberland had signs of disturbance. Thirty-eight percent of publicly-owned and 37 percent of non-industrial private timberland were disturbed.

Commercial harvesting (excluding thinning) was carried out on 4.9 million acres or 42 percent of east Texas timberland. Partial cutting was the most commonly used harvesting practice, accounting for about two-thirds of the harvested area. One-third of the harvested area was clearcut with the remaining 2 percent consisting of seed tree and shelterwood cuts. Partial cuts dominated the harvest activity on non-industrial private land. Clearcuts were more prevalent on forest industry tracts.

Nearly half of the commercial harvest activity was conducted on pine-type timberland (fig. 21). An additional 25 percent of the harvesting was in oak-pine stands. The oak-hickory and bottomland hardwood types received 18 percent and 9 percent of the harvesting, respectively.

Pine regeneration in harvested stands can be assessed by examining the degree of pine stocking following harvest. Pine regeneration is most important in harvested pine and oak-pine stands because they previously supported pine timber. The data indicates that 58 percent of the pine and oak-pine stands that were cut using clearcuts or partial cuts had high stocking of pine, with an additional 22 percent having medium stocking of pine (see Definition of Terms). Public owners were most suc-

Table XVI.—Area of timberland by ownership, and type of harvest or management disturbance, east Texas, 1986¹

Ownership	Total	No disturbance	Commercial harvest			Other management ³
			Clearcut	Partial cut ²	Seed tree and shelterwood cuts	
-----Thousand acres-----						
Public	763.0	471.9	52.9	150.7	6.9	80.4
Forest industry	3,795.5	1,298.3	1,191.2	1,020.5	54.2	231.3
Nonindustrial private	7,006.9	4,381.1	390.7	1,990.6	42.1	202.7
Total	11,565.3	6,151.4	1,634.8	3,161.7	103.2	514.6

¹Rows and columns may not sum to totals due to rounding.

²Includes pine selection, diameter-limit, and salvage cuts. Thinnings in poletimber stands are excluded; some heavy thinnings of dominant trees in sawtimber stands are included.

³Includes precommercial thinnings, commercial thinnings, and stand improvements such as cleaning, release, or other intermediate treatments.

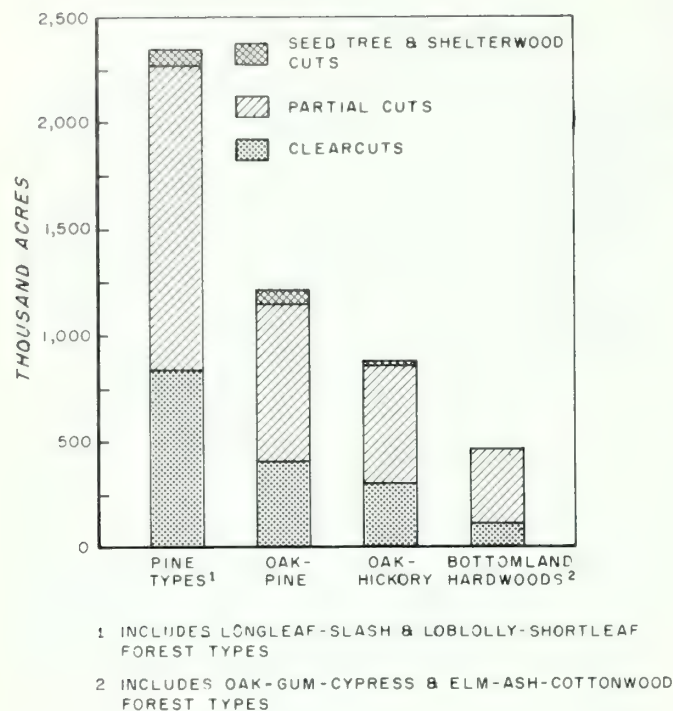


Figure 21.—Area of timberland harvested by type of harvest, and forest type, 1975 to 1986.

cessful at regenerating to pine with 82 percent of the 185.9 thousand acres of harvested pine and oak-pine stands in the high pine stocking class (fig. 22). Forest industry had 66 percent in the high pine stocking class (out of 1.8 million acres that were cut), and nonindustrial private owners had 46 percent in the high pine stocking class (out of 1.5 million acres). Some of the harvested pine and oak-pine stands were recently cut and may be scheduled for pine reforestation in the near future. There are 698.6 thousand acres of heavily-cut pine and oak-pine stands that lack adequate regeneration. Conversion of hardwood forest types to pine was apparent on forest industry properties. Fifty-eight percent of the clearcut hardwood type timberland exhibited medium or high pine stocking (McWilliams and Skove 1987).

TIMBER MANAGEMENT OPPORTUNITIES

All FIA sample plots on pine and oak-pine timberland were assigned a treatment opportunity based on stand size, stocking characteristics, saw-timber volume, and other conditions. The definitions of treatment opportunities are aimed at prescribing treatments that would improve or enhance overall timber quality and growth characteristics of the stand. Treatment opportunities were developed using broad silvicultural guidelines rather than

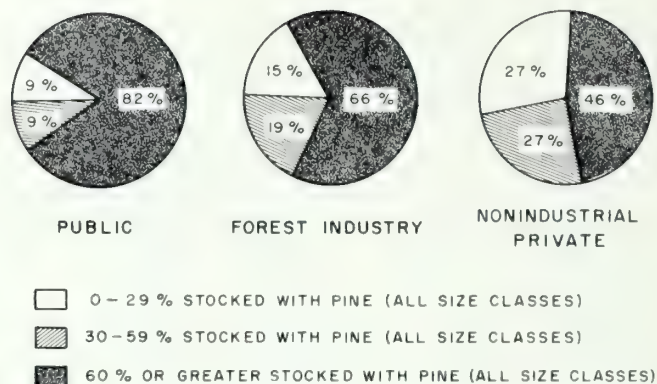


Figure 22.—Status of pine and oak-pine type timberland harvested using clearcuts and partial cuts, 1975 to 1986.

economic criteria, and apply to the wide range of conditions found in timber stands of the South Central States. Treatments are not intended as specific recommendations for particular owners because management objectives may vary considerably, and economic constraints may limit feasibility. No attempt was made to assign a treatment opportunity for hardwood forest types because existing guidelines focus on the pine resource.

Most of the timberland supporting pine forest types (70 percent) is in good condition with adequate stocking of growing-stock trees, and needs no treatment (table XVII). Twenty percent of the acreage currently classified as pine plantation is recommended for either thinning (in poletimber stands) or stocking control measures. Thinning of poletimber is recommended where stocking of growing-stock trees is 110 percent or more of a stand's total stocking. Stocking control measures include cleaning, release, or cull tree removal in sapling-seedling or poletimber stands where competing vegetation limits the survival or growth of crop trees. About three-fourths of the stands in need of thinning or stocking control are owned by forest industry. The area in pine plantations could be expanded by treating the 613.3 thousand acres that already show evidence of planting but are classified as oak-pine and hardwood types because of a dominant hardwood component. Three-fourths of these stands are owned by forest industry. There are additional opportunities on cut-over sites suited for growing pine that currently support hardwoods.

The opportunity for final harvest exists on 475.9 thousand acres of natural pine stands. Final harvest is recommended for stands that contain at least 5,000 board feet (International 1/4-inch rule) per acre. More than half the stands in this condition are on nonindustrial private timberland.

Fifty-six percent of the oak-pine type timberland is in good condition and requires no treatment. Most

Table XVII.—Area of timberland by forest class, ownership, and treatment opportunity for pine and oak-pine forest types, east Texas, 1986¹

Forest class and ownership	Stand establishment			Intermediate treatments				Final harvest	
	Total	No treatment	Regenerate	Stand conversion ²	Thin seedlings and saplings	Thin poletimber	Other stocking control ³	Regeneration cut	Salvage cut
<i>Thousand acres</i>									
Pine plantation ⁴									
Public	74.8	45.7	6.3	.....	.....	6.1	11.2	.....	5.5
Forest industry	868.6	593.3	60.6	.....	.....	65.7	130.5	13.0	5.5
Nonindustrial private	235.3	158.8	12.3	.....	.....	28.2	16.6	19.4	.....
Total	1,178.7	797.8	79.1	.....	.....	100.1	158.3	32.4	11.0
Natural pine ⁵									
Public	414.7	241.7	.....	.....	.....	6.8	.....	122.2	43.9
Forest industry	815.6	614.0	58.8	.....	.....	11.6	18.1	95.9	17.2
Nonindustrial private	1,807.6	1,278.8	105.2	.....	.....	31.0	75.2	257.8	59.5
Total	3,037.8	2,134.6	164.0	.....	.....	49.5	93.3	475.9	120.6
Oak-pine									
Public	95.7	66.5	.....	.....	.....	.....	.....	22.8	6.4
Forest industry	872.7	399.6	220.6	.....	12.0	.....	193.8	17.7	29.1
Nonindustrial private	1,433.3	853.8	308.4	.....	.....	11.1	163.8	47.3	49.0
Total	2,401.8	1,319.9	529.0	.....	12.0	11.1	357.5	87.8	84.5
All classes									
Public	585.2	353.9	6.3	.....	.....	13.0	11.2	145.0	55.8
Forest industry	2,556.9	1,606.9	339.9	.....	12.0	77.4	342.3	126.6	51.7
Nonindustrial private	3,476.2	2,291.5	425.9	.....	.....	70.3	255.6	324.5	108.5
Total	6,618.3	4,252.3	772.1	.....	12.0	160.7	609.1	596.1	216.6

¹Rows and columns may not sum to totals due to rounding.

²Stands containing considerable stocking of damaged or diseased trees but with insufficient merchantable volume to warrant a salvage cut.

³Clean, release, or cull tree removal.

⁴Includes longleaf-slash and loblolly-shortleaf stands having evidence of artificial origin.

⁵Includes longleaf-slash and loblolly-shortleaf stands having no evidence of artificial origin.

TIMBER SUPPLY OUTLOOK

opportunities in other oak-pine stands involve regeneration and stocking control. The recommendation for stocking control is made for sapling-seedling and poletimber stands with excessive stocking of cull trees (greater than 30 percent). Timberland with opportunities for regeneration and stocking control includes 200.7 thousand acres with some planted pines.

Oak-hickory forests are often neglected in the South because forest management is usually directed towards pines. With the exception of the western fringe of east Texas, oak-hickory stands commonly result from pine management activities. Eighty percent of the 872.9 thousand acres of oak-hickory stands 10 years of age or younger are cut-over pine and oak-pine stands (698.6 thousand acres).

Bottomland hardwood forests occupy a minor portion of east Texas timberland, but often contain timber of the highest quality. Stand establishment, regeneration following harvest, and management would help counter the effect of declines in the acreage of bottomland hardwoods.

The size of an individual tract of timberland has an impact on the economics of forest management (Dutrow 1984; Tufts 1983). The feasibility of stand establishment, intermediate treatments, and final harvest practices is often limited on smaller tracts. Most of east Texas timberland (87 percent) is in tracts greater than 100 acres in size (table XVIII). Planted pine stands have the smallest percentage in tracts 100 acres in size or smaller (7 percent), and oak-hickory stands have the highest percentage (17 percent). Fifty-eight percent of east Texas timberland is in tracts greater than 500 acres.

East Texas forests have undergone significant change over the past 11 years. With respect to the pine resource, heavy harvests of mature pine stands and younger stands on pulpwood rotations have reversed trends of rapid increases in softwood inventory reported in earlier surveys.

Liquidation and subsequent reforestation of pine stands on forest industry land has shifted a considerable amount of timberland into younger age classes. This timberland will provide considerable supplies of timber for east Texas' long-term future. Nonindustrial private timberland will likely satisfy more of the short-term supply needs than in the past. One perplexity is seen in the short-term supply scenario because nonindustrial private timberland is concentrated in the Northeast region, which is distant from many of the larger mills of the Southeast region.

The inventory of softwood growing stock will continue a gradual decline until recently established pines reach merchantable size. Inventory and growth should then increase substantially. Improvement in the regeneration of nonindustrial private pine stands harvested over the past 10 years is needed. Pine regeneration will become even more important as harvesting shifts to nonindustrial private lands over the next decade.

Establishment of manageable hardwood stands has decreased for many decades. Most new stands result from recent pine harvest activities and some will likely be converted to pine in the future. Increased demand for hardwood over the past 11 years has put additional strain on the resource. Gains in

Table XVIII.—Area of timberland by forest class and size of tract, east Texas, 1986¹

Forest class	Size of tract (acres)							
	Total	1-10	11-50	51-100	101-500	501-2,500	2,501-5,000	More than 5,000
-----Thousand acres-----								
Pine plantation ²	1,178.7	.....	12.5	68.9	409.5	409.8	154.9	123.1
Natural pine ³	3,037.9	18.0	200.5	218.8	760.3	1,195.0	388.1	257.4
Oak-pine	2,401.8	26.0	76.3	130.2	710.1	883.6	419.2	156.4
Oak-hickory	3,369.3	57.6	214.8	310.6	991.3	1,203.8	386.5	204.8
Bottomland hardwoods ⁴	1,577.7	31.2	34.1	119.8	432.1	510.7	247.7	202.1
Total	11,565.3	132.8	538.1	848.3	3,303.1	4,202.8	1,596.4	943.8

¹ Rows and columns may not sum to totals due to rounding.

² Includes longleaf-slash and loblolly-shortleaf stands having evidence of artificial origin.

³ Includes longleaf-slash and loblolly-shortleaf stands having no evidence of artificial origin.

⁴ Includes oak-gum-cypress and elm-ash-cottonwood forest types.

the inventory of hardwood timber will be more moderate than in the past; however, utilization of small-diameter and low-quality hardwoods represents an opportunity for expanding the existing resource.

TIMBER PRODUCTS OUTPUT

Wood-based manufacturing industries comprise an important part of east Texas' economy, providing jobs to 60,500 people and a payroll of \$958 million. The value of wood and paper products shipped annually totals \$5.5 billion. Timber ranks second in importance to cotton, when Texas agricultural crops are compared based on value at local point of delivery (USDA-FS 1988).

Statistics concerning annual timber products output by forest industry in Texas are compiled annually by the Texas Forest Service. The data are based on a 100 percent canvass of primary forest products industries (Texas Forest Service 1986). With the exception of the pulpwood information, which is based on a report by Hutchins (1987), product output data for 1975 to 1985 presented in this report are based on the industry canvass. Data for 1974 was published as part of the 1975 survey of east Texas (Bertelson 1975).

Industrial Timber Output

In 1985, 386.7 million cubic feet of softwoods and 80.7 million cubic feet of hardwoods were used by east Texas' timber industry (table XIX). (These estimates exclude harvest of industrial or residential fuelwood, local or farm use, other unreported use, as well as unutilized material that was cut, such as logging residues, trees killed by logging or timber stand improvement activity, trees left in windrows after logging, cut and leave trees, etc. . .). This represented an increase of 3 percent for softwoods and no change for hardwoods (table XX).

Most of the Texas timber was utilized within the State (fig. 23). Net exports of roundwood in 1985 included 11.4 million cubic feet of softwoods and 4.2 million cubic feet of hardwood material. Seventy-five percent of the export volume was pulpwood material.

The total industrial timber output is composed of a number of roundwood products: pulpwood; saw logs; veneer logs; and posts, poles, and pilings. In addition to using roundwood, the industry utilizes plant byproducts, such as wood chips, sawdust, and veneer cores in the manufacture of wood products.

Pulpwood and Paper Production

Pulpwood material obtained from east Texas'

forests totaled 4.1 million cords in 1985, 52 percent of the total industrial wood consumption. This total consisted of 1.6 million cords of pine roundwood, 1.6 million cords of pine chips and sawdust, 0.6 million cords of hardwood roundwood, and 0.4 million cords of hardwood chips and sawdust. Total pulpwood consumption (roundwood and residues) reflected an increase of 7 percent since 1974. Hardwood fiber consumption rose faster than did pine. Pine pulpwood use was down 3 percent, while hardwood utilization was up 69 percent. This trend illustrates the increasing importance of hardwood fiber in pulp operations.

The 1.6 million cords of softwood pulpwood produced in 1985 represented the largest share (33 percent) of the state's pine timber output. However, roundwood pulpwood seems to have become less important over the eleven years between 1974 and 1985 (fig. 24). The pine roundwood pulpwood output in 1985 was 27 percent less than that in 1974. This trend is due to a number of factors. First, the use of plant residues has become increasingly important as a substitute for pine roundwood. Use of pine chips and sawdust increased 45 percent, from 1.1 million cords in 1974 to 1.6 million cords in 1985. Second, as noted above, advances in papermaking technology are allowing increased use of cheaper hardwood fiber as pulping material. Hardwoods, including roundwood and residues, rose from 14 percent to 23 percent of total pulpwood volume during the period. The use of hardwood roundwood in pulp operations increased 28 percent over the 11-year period, and pulpwood now accounts for 55 percent of the hardwood output. Hardwood chip and sawdust use, nearly nonexistent in 1974, increased considerably in 11 years.

Texas' 8 pulp and paper mills produced 2.5 million tons of paper and paperboard products in 1985. Texas production represented 4 percent of the national output. Figures for paper production are not available prior to 1981; however, production trends would parallel pulpwood consumption trends. Since 1981, annual paper production has ranged between 2.4 and 2.5 million tons.

Saw Logs and Lumber Production

Saw logs are the second-ranking forest products category, comprising 37 percent of the total roundwood output. In 1985, 996.2 million board feet of saw logs were produced from Texas' timberlands.

Pine sawtimber output has been quite cyclical over the past 11 years (fig. 25). Output rose from 776.1 million board feet in 1974 to 932.6 million board feet in 1978 in response to heavy demand for housing construction. Volume declined to 545.8 mil-

Table XIX.—Total output of timber products by product, species group, and type of material used, east Texas, 1985

Product and species group	Standard units	Total output		From roundwood		From plant byproducts	
		Number	Thousand cubic feet	Number	Thousand cubic feet	Number	Thousand cubic feet
Saw logs							
Softwood	thousand board feet ¹	908,107	149,121	790,633	139,331	117,474	9,790
Hardwood	thousand board feet ¹	205,581	34,476	205,581	34,476	.....	.....
Total	thousand board feet ¹	1,113,688	183,597	996,214	173,807	117,474	9,790
Veneer logs							
Softwood	thousand board feet ¹	717,497	116,306	717,497	116,306	.....	.....
Hardwood	thousand board feet ¹	10,542	1,768	10,542	1,768	.....	.....
Total	thousand board feet ¹	728,039	118,074	728,039	118,074	.....	.....
Pulpwood							
Softwood	standard cords	3,203,556	259,488	1,573,256	127,434	1,630,300	132,054
Hardwood	standard cords	932,050	74,564	556,050	44,484	376,000	30,080
Total	standard cords	4,135,606	334,052	2,129,306	171,918	2,006,300	162,134
Pilings							
Softwood	thousand linear feet	813	553	813	553	.....	.....
Hardwood	thousand linear feet	.....	.....	.....	.....	.....	.....
Total	thousand linear feet	813	553	813	553	.....	.....
Poles							
Softwood	thousand pieces	139	2,349	139	2,349	.....	.....
Hardwood	thousand pieces	.....	.....	.....	.....	.....	.....
Total	thousand pieces	139	2,349	139	2,349	.....	.....
Posts							
Softwood	thousand pieces	1,055	760	1,055	760	.....	.....
Hardwood	thousand pieces	.....	.....	.....	.....	.....	.....
Total	thousand pieces	1,055	760	1,055	760	.....	.....
Total industrial products							
Softwood		.....	528,577	.....	386,733	.....	141,844
Hardwood		.....	110,808	.....	80,728	.....	30,080
Total		.....	639,385	.....	467,461	.....	171,924

¹International 1/4-inch rule.

lion board feet by 1982, then recovered to 790.6 million board feet in 1985.

Hardwood saw-log output was also cyclical. The 1985 output of 205.6 million board feet was 19 percent below the 1974 output. Peak output, 278.4 million board feet, occurred in 1980.

Additional saw-log material is available from veneer cores produced as a byproduct of the plywood manufacturing process. In 1985, 117.5 million board feet of cores were used in the manufacture of sawn products. By comparison, 63.8 million board feet of veneer cores were utilized in 1974 (Murphy 1976).

The 71 Texas sawmills surveyed in 1985 produced 1.0 billion board feet of lumber including over 1.0 million railroad ties. Softwood lumber comprised the majority of the 856.2 million board feet. While the number of sawmills has been declining steadily for years, lumber production has changed little. Total lumber production since 1974 has consistently exceeded the output in that year of 856.2 million board feet, and has exceeded 1.0 billion board feet in 7 of the 11 years since. Production levels are only slightly below those attained during the boom years at the turn of the century and during the 1950's.

Table XX.—*Output of roundwood timber products in east Texas, 1974 and 1985*

Product	Standard unit	Species	Volume		Percent change
			1974	1985	
Saw logs	thousand board feet ¹	Softwood	776,105	790,633	2
		Hardwood	252,788	205,581	-19
Veneer logs	thousand board feet ¹	Softwood	439,331	717,497	63
		Hardwood	21,013	10,542	-50
Pulpwood	standard cords	Softwood	2,168,435	1,573,256	-27
		Hardwood	432,171	556,050	29
Pilings	thousand linear feet	Softwood	244	813	233
Poles	thousand pieces	Softwood	378	139	-63
Posts	thousand pieces	Softwood	2,089	1,055	-50
Misc. products	thousand cubic feet	Softwood	177	.....	.....
		Hardwood	525	.....	.....
Total products	thousand cubic feet	Softwood	374,639	386,733	3
		Hardwood	80,971	80,728	0

¹International 1/4-inch rule.

Veneer Logs and Panel Products

Softwood veneer logs demonstrated the most rapid growth of the pine products between 1974 and 1985, corresponding to a dramatic growth in the capacities of southern pine plywood mills. The total of 717.5 million board feet used in 1985 was 63 percent higher than the 1974 output (fig. 26).

The distinction between veneer logs and saw logs has become less and less clear in recent years because new technology has allowed utilization of smaller diameter, lower quality saw logs in plywood manufacture. Another factor that will affect future veneer log consumption is the shift toward reconstituted wood panel products such as waferboard and oriented strand board. Currently, Texas has one operating waferboard plant as well as several others in various stages of planning or construction.

The 10 panel plants produced 1,985.7 million square feet of plywood and waferboard in 1985, and accounted for 9 percent of the U.S. structural panel production. Output was more than 2 1/2 times the 782.6 million square feet manufactured by 9 panel mills in 1974.

A small amount of hardwood veneer is manufactured in Texas each year. However, annual volumes have been dropping steadily. The 1985 output of 10.5 million board feet was only one-half of the 1974 output. This apparently results from a decline in veneer quality bottomland hardwood trees. Four

hardwood veneer mills were in operation in 1985. These mills produced 11.3 million board feet of container and commercial veneer products including crates, baskets, and flooring.

Posts, Poles, and Pilings

Output of posts, poles, and pilings totaled 3.7 million cubic feet in 1985, 36 percent less than the 1974 output. The importance of these products has fluctuated over the 11-year period between surveys. Production has averaged 6.2 million cubic feet annually, but has varied between 3.7 and 13.1 million cubic feet.

FOREST RESOURCES OF THE LOST PINES

A disjunct population of loblolly pine, known as the Lost Pines, is found in isolated stands scattered throughout Bastrop, Caldwell, Colorado, Fayette, and Lee counties. A forest inventory of the Lost Pines was conducted with the goal of analyzing the pine type timberland of the region. To satisfy this goal, all FIA plots that fell within the forest fire protection zone designated by the Texas Forest Service were sampled (fig. 27). Most of the sample region is in Bastrop County.

The Lost Pines represent the westernmost limit of loblolly's natural range. The Lost Pines loblolly



Figure 23.—Primary wood-using plants in east Texas, 1986.

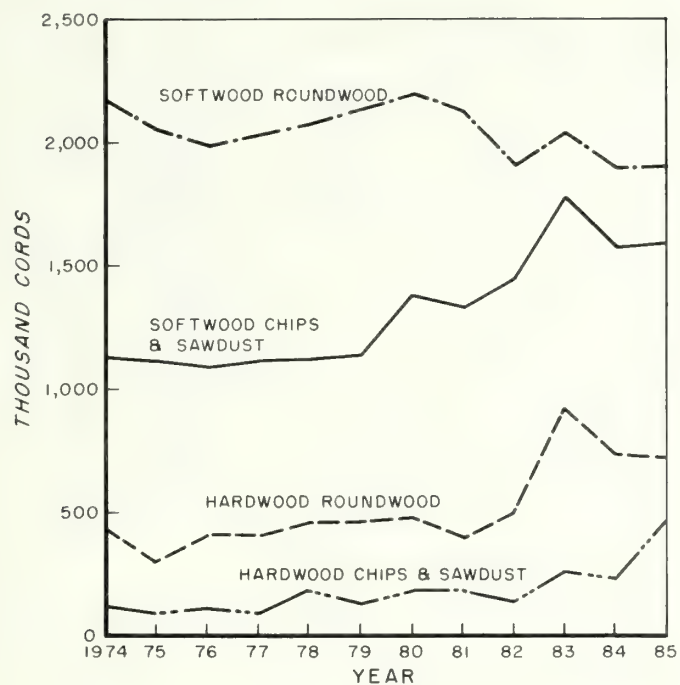


Figure 24.—Pulpwood production, 1974 to 1985.

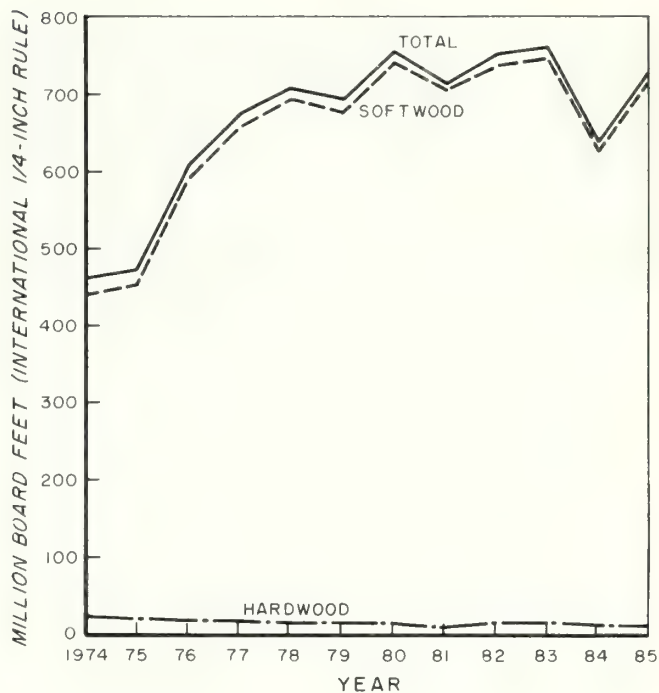


Figure 26.—Output of veneer logs, 1974 to 1985.

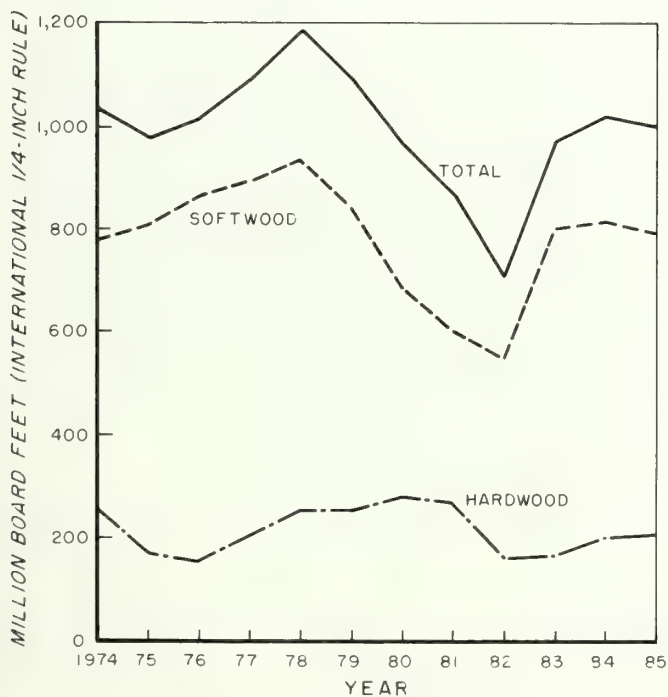


Figure 25.—Output of sawtimber products, 1974 to 1985.

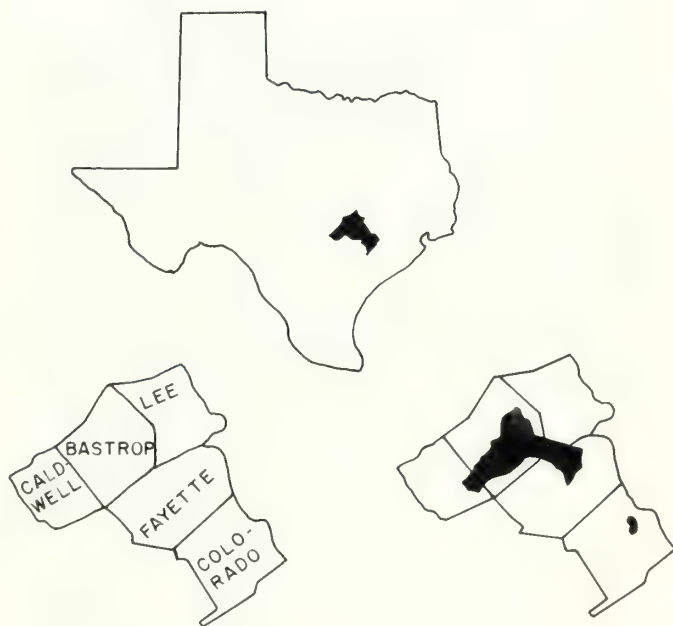


Figure 27.—Lost Pines sample region.

resource is of little commercial value because the total growing-stock inventory is relatively small and few timber processing facilities are near. Loblolly pine of the Lost Pines is more important for its scientific value. Rainfall in the Lost Pines area is about one-half of that received over most of loblolly's natural range (Wahlenberg 1960). The superior drought resistance of Lost Pines' loblolly pine is well documented (Bilan and others 1977; Goddard and Brown 1959; van Buijtenen and others 1976; Zobell 1955). The Lost Pines area is also well known for its recreational and scenic importance.

The terrain of the Lost Pines area consists of rolling hills and broad level valleys. Much of the area is agricultural land including pasture, cropland, and idle land. Forests cover 49 percent of the area sampled in the Lost Pines. Timberland totals 143.0 thousand acres (subject to a 2 percent sampling error) or 84 percent of the forested acreage.

Species composition is comprised of loblolly pine intermingled with varying density among post oak and other hardwoods. Pines generally contribute most of the merchantable volume in stands where they occur, because the hardwoods tend to be small and poorly formed. The pure loblolly pine forest type covers 38.5 thousand acres (27 percent of the timberland) (table XXI). Oak-pine stands, consisting of loblolly-hardwood and redcedar-hardwood stands, along with oak-hickory stands make up the remaining timberland. The oak-hickory timberland consists mostly of stands dominated by post oak.

Nonindustrial private owners hold 92 percent of the Lost Pines timberland. The remaining 8 percent is publicly owned timberland in Bastrop State Park.

Per-acre volumes were less than 1,500 board feet on nearly two-thirds of the Lost Pines timberland. In contrast, 39 percent of the Pineywoods timberland had less than 1,500 board feet per acre (appendix table 4).

The most abundant species sampled in the Lost Pines area were loblolly pine, post oak, and redcedar. Distribution of growing-stock trees by di-

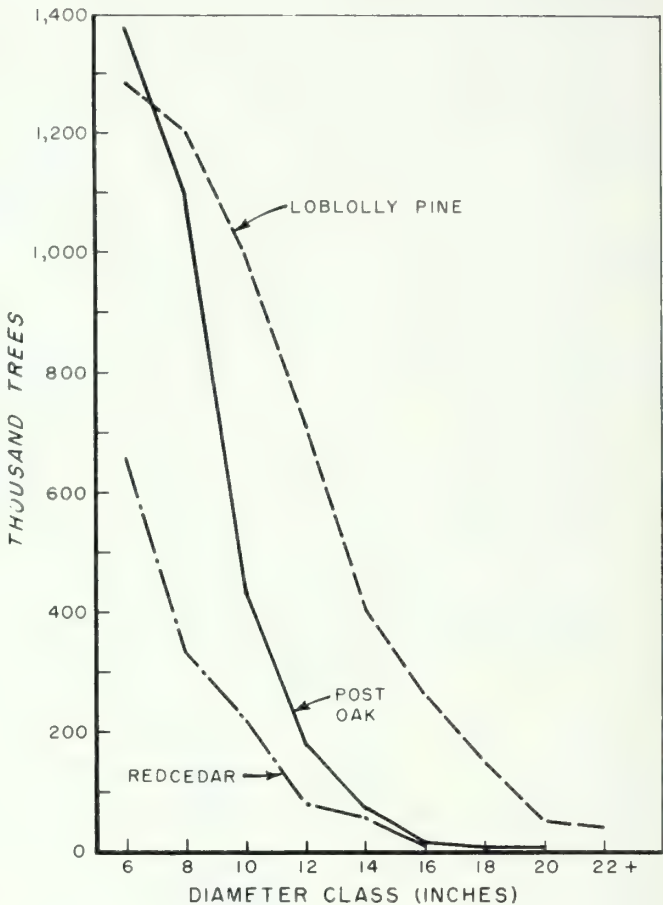


Figure 28.—Number of loblolly pine, post oak, and redcedar growing-stock trees, Lost Pines, 1986.

ameter class for these species is shown in figure 28. The dominance of loblolly pine is apparent across all diameters except the 6-inch class. Post oak and redcedar trees are generally smaller in diameter and less prevalent.

The Lost Pines area contains about 85.0 million cubic feet of growing stock (subject to a 19 percent sampling error); 80 percent of which is softwood. Loblolly pine (pine stands in which loblolly pine

Table XXI.—Area of timberland by ownership, forest type, and stand-volume class, Lost Pines, 1986

Forest type	Ownership		Stand-volume class ¹		
			Thousand acres	Million board feet ¹	Thousand acres
Loblolly pine	38.5	Public	11.0 ²	less than 1,500	93.5
Oak-pine	49.5	Forest industry	.....	1,500 to 5,000	33.0
Oak-hickory	55.0	Nonindustrial private	132.0	more than 5,000	16.5 ²
Total	143.0	Total	143.0		143.0

¹In board feet, international 1/4-inch rule.

²Sampling error exceeds 5 percent.

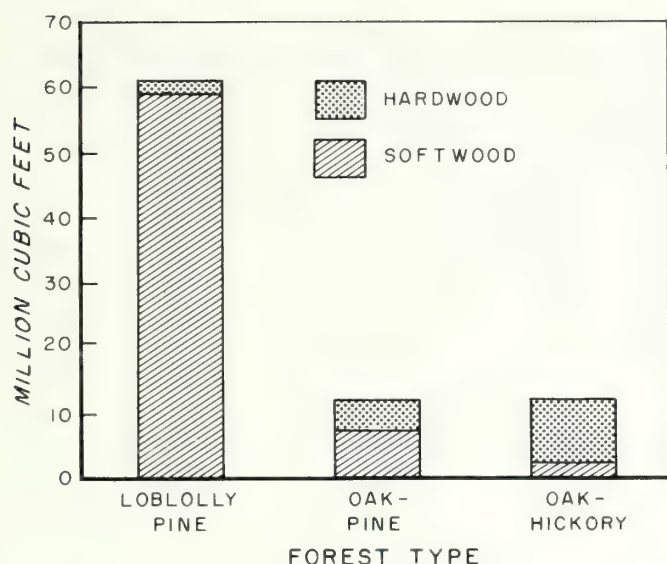


Figure 29.—Volume of growing stock by forest type, and species, *Lost Pines*, 1986.

comprises the plurality of pine stocking) is by far the most important forest type with 71 percent of the total growing-stock volume and 86 percent of the softwood growing-stock volume (fig. 29).

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APPENDIX

Survey Methods

Forest resource statistics were secured by a systematic sampling method involving forest-nonforest classification on aerial photographs and on-the-ground measurement of trees at selected locations. The locations selected were at intersections of a grid of lines spaced three miles apart.

Initial estimates of forest area were obtained by interpreting 95,640 photopoints using dot counts and the most recent aerial photography available. The dot counts provided an estimate of the proportion of forest to nonforest that was used along with U.S. Census land area data to develop county-level forest area statistics. The photointerpretation estimate was then adjusted by ground checks of all locations on the three-mile grid, as well as intensification plots located between plots sampled.

Timber statistics were estimated from measurements taken at each forested location. Samples consist of 10 permanent horizontal points at each forested location. At each point, trees 5.0 inches d.b.h. or greater are tallied using a 37.5 factor prism, thus each tree represents 3.75 square feet of basal area per acre. Trees less than 5.0 inches d.b.h. are tallied on a 1/275 acre circular fixed plot on the first three points. Pine seedlings are tallied on a 1/1000-acre plot established at each of the 10 points.

Tree volumes were obtained using deterministic tree measurements and Grosenbaugh's STX algorithm (1964).¹ Tree measurements include stump diameter, diameter at breast height, bark thickness, saw-log length, bole length, total height, and 4 upper stem diameters. Growth was computed using present and past volumes of remeasured trees. Growth on trees that died or trees that were cut during the inter-survey period was estimated from regression equations that were developed using data from the remeasured population. The total volume of trees that died or were cut was also determined using regression.

Measurements at each forested location included the collection of additional data on site productivity, stand origin, stand age, size of forest tract, distance from road, slope, aspect, disturbance, management, evidence of use, and nontimber resources. Ownership information was obtained for each plot from county tax assessors' records and contact with owners in the field. Personnel from the Agricultural Stabilization and Conservation Service, Soil Con-

servation Service, and other contacts were consulted when classifying absentee owners as farmers, individuals, corporations, or leaseors.

Field work was started in April, 1985, and completed in February, 1986. A total of 3,761 forested locations on the three-mile grid in the Pineywoods were visited by survey crews. The sample included 1,910 commercial timberland plots, 24 productive-reserved plots, 19 unproductive forest plots, and 1,809 nonforest plots (see Definition of Terms section). In addition, a subsample of 1,867 intensification plots were ground-checked for status as forest or nonforest.

The Lost Pines survey field work was completed in February, 1986. A total of 65 sample locations on the three-mile grid were visited by survey crews; including 26 plots classified timberland, 5 plots unproductive, and 34 plots nonforest. Thirty-six intensification plots were ground-checked for status as forest or nonforest.

Reliability of the Data

Reliability of FIA estimates may be affected by two sources of error. The first source, termed "estimating error", arises from mistakes in measurement, judgment, recording, or compiling, and from limitations of the equipment. Estimating error is minimized by FIA through comprehensive training, supervision, quality control programs, and emphasis on careful work.

A second source of error, called "sampling error", is the statistical error associated with FIA's sample-based estimation procedures. Sampling errors are commonly referred to as percentages and are based on a standard deviation of one. The chances are two out of three, that if the results of a complete enumeration were known, the sample-based estimates would have been within the limits indicated. The FIA sample scheme has the objective of providing forest area and volume estimates of 1 percent per million acres and 5 percent per billion cubic feet. Sampling errors for the Pineywoods of Texas are shown in table XXII.

Sampling errors increase as estimates are made below the State level, for breakdowns such as forest type and stand size. The relationship between sampling error and the degree of disaggregation is depicted in table XXIII.

Definition of Terms

Forest Land Classes

Forest Land—Land stocked at least 16.7 percent by forest trees of any size, or formerly having such

¹Grosenbaugh, L.R. 1964. STX—FORTRAN 4 program for estimates of tree populations from 3-p sample-tree measurements. Res. Pap. PSW-13. Berkeley, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station. 49 p.

Table XXII.—*Sampling errors for estimates of total timberland area, volume, net annual growth (1975–1986), and annual removals (1975–1986), east Texas, 1986*

Item	Total	Units	Percent sampling error
Timberland area	11,565.3	thousand acres	0.3
Growing stock			
Volume	12,446.7	million cubic feet	1.9
Periodic net annual growth	626.8	million cubic feet	2.0
Periodic annual removals	612.0	million cubic feet	2.7
Sawtimber			
Volume	50,493.9	million board feet ¹	2.2
Periodic net annual growth	2,962.1	million board feet ¹	2.4
Periodic annual removals	2,427.6	million board feet ¹	2.9

¹International 1/4-inch rule.

Table XXIII.—*Sampling error to which estimates are liable, 2 chances out of 3, east Texas, 1986¹*

Sampling error	Timberland area	Volume	Periodic net annual growth	Periodic annual removals	Volume	Periodic net annual growth	Periodic annual removals
Percent	Thousand acres	-----Million cubic feet-----	-----Million board feet ² -----				
1.0	1,040.9	.....	.....	.....	.....	.....	.....
2.0	260.2	11,233.2	626.8	.....	.....	.....	.....
3.0	115.6	4,992.5	278.6	495.7	27,154.5	1,895.7	1,553.7
4.0	65.1	2,808.3	156.7	278.8	15,274.4	1,066.4	873.9
5.0	41.6	1,797.3	100.3	178.5	9,775.6	682.5	559.3
10.0	10.4	449.3	25.1	44.6	2,443.9	170.6	139.8
15.0	4.6	199.7	11.1	19.8	1,086.2	75.8	62.2
20.0	2.6	112.3	6.3	11.2	611.0	42.6	35.0
25.0	1.7	71.9	4.0	7.1	391.0	27.3	22.4

¹By random sampling formula.

²International 1/4-inch rule.

tree cover, and not currently developed for nonforest uses. Minimum area considered for classification is one acre. Forest land is divided into commercial categories: timberland, deferred timberland, and noncommercial categories: productive-reserved forest land, unproductive forest land.

Timberland—Forest land that is producing, or is capable of producing, crops of industrial wood and not withdrawn from timber utilization. Timberland is synonymous with “commercial forest land” in prior reports.

Deferred Timberland—National Forest land that meets productivity standards for timberland but is under study for possible inclusion in the wilderness system.

Productive-Reserved Forest Land—Productive public forest land withdrawn from timber utilization through statute or administrative regulations.

Unproductive Forest Land—Forest land incapable of yielding crops of industrial wood because of adverse site conditions.

Tree Classes

Commercial Species—Tree species currently or prospectively suitable for industrial wood products. Excluded are noncommercial species (see Species List).

Noncommercial Species—Tree species of typical small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products (see Species List).

Growing-Stock Trees—Live trees of commercial species classified as sawtimber, poletimber, sapling, and seedling. Trees must have a 12-foot butt log now or prospectively to be classed as growing stock.

Rough Trees—Live trees of commercial species that are unmerchantable for saw logs currently or potentially because of roughness or poor form in the butt log. Also included are all live trees of non-commercial species.

Rotten Trees—Live trees of commercial species

that are unmerchantable for saw logs currently or potentially because of rot deduction in the butt log.

Cull Trees—Rough or rotten trees.

Hardwoods—Dicotyledonous trees, usually broad-leaved and deciduous.

Softwoods—Coniferous trees, usually evergreen having needle or scalelike leaves.

Live Trees—All trees that are alive. Included are all size classes and all tree classes.

Salvable Dead Trees—Standing or downed dead trees that were formerly growing stock and are considered merchantable.

Forest Types

Longleaf-Slash Pine—Forests in which longleaf or slash pine, singly or in combination, comprise a plurality of the stocking. Common associates include oak, hickory, and gum.

loblolly-Shortleaf Pine—Forests in which pine and eastern redcedar (except longleaf or slash pine), singly or in combination, comprise a plurality of the stocking. Common associates include oak, hickory, and gum.

Oak-Pine—Forests in which hardwoods (usually upland oaks) comprise a plurality of the stocking, but in which softwoods, except cypress, comprise 25–49 percent of the stocking. Common associates include gum, hickory, and yellow-poplar.

Oak-Hickory—Forests in which upland oaks or hickory, singly or in combination, comprise a plurality of the stocking except where pines comprise 25–49 percent, in which case the stand would be classified oak-pine. Common associates include yellow-poplar, elm, maple, and black walnut.

Oak-Gum-Cypress—Bottomland forests in which tupelo, blackgum, sweetgum, oaks, or cypress, singly or in combination, comprise a plurality of the stocking except where pines comprise 25–49 percent, in which case the stand would be classified oak-pine. Common associates include cottonwood, willow, ash, elm, hackberry, and maple.

Elm-Ash-Cottonwood—Forests in which elm, ash, or cottonwood, singly or in combination, comprise a plurality of the stocking. Common associates include willow, sycamore, beech, and maple.

Dimension Classes of Trees

Sawtimber Trees—Trees 9.0 inches and larger in d.b.h. for softwoods, and 11.0 inches and larger for hardwoods.

Poletimber Trees—Trees 5.0 to 8.9 inches in d.b.h. for softwoods and 5.0 to 10.9 inches in d.b.h. for hardwoods.

Saplings—Trees 1.0 to 4.9 inches in d.b.h.

Seedlings—Trees which are less than 1.0 inch in d.b.h.

Rough, Rotten, and Salvable Dead Trees—See “tree classes”.

Stand-Size Classes

Sawtimber Stands—Stands stocked at least 16.7 percent with growing-stock trees, with half or more of this stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber Stands—Stands stocked at least 16.7 percent with growing-stock trees, with half or more of this stocking in sawtimber or poletimber trees, and with poletimber stocking exceeding that of sawtimber stocking.

Sapling-Seedling Stands—Stands stocked at least 16.7 percent with growing-stock trees, with more than half of this stocking in saplings or seedlings.

Nonstocked Stands—Stands stocked less than 16.7 percent with growing-stock trees.

Stocking

Stocking is a measure of the extent to which the growth potential of the site is utilized by trees or preempted by vegetative cover. Stocking is determined by comparing the stand density in terms of number of trees or basal area with a specified standard. Therefore, full stocking is 100 percent of the stocking standard.

The tabulation below shows the density standard in terms of trees per acre by size class, required for full stocking.

D.b.h. (inches)	Number of trees	D.b.h. (inches)	Number of trees
Seedlings	600	16	72
2	560	18	60
4	460	20	51
6	340	22	42
8	240	24	36
10	155	26	31
12	115	28	27
14	90	30	24

Volume

Volume of Cull—The volume of sound wood in the bole of rough and rotten trees.

Volume of Growing Stock—Volume of sound wood in the bole of sawtimber and poletimber trees from a 1-foot stump to a minimum 4.0-inch top d.o.b. or to the point where the central stem breaks into limbs. Rough, rotten, and noncommercial trees are excluded.

Volume of Sawtimber—Net volume of the saw-log portion of live sawtimber trees in board feet of the International rule (1/4-inch kerf). Net volume equals gross volume less deductions for rot, sweep, and other defects that affect use for lumber. Rough, rotten, and noncommercial trees are excluded.

Volume of Timber—The volume of sound wood in the bole of growing stock, rough, rotten, and salvable dead trees 5.0 inches and larger in d.b.h. from a 1-foot stump to a minimum 4.0-inch top d.o.b., or to the point where the central stem breaks into limbs.

Biomass

Merchantable Dry Weight—Dry weight of woody biomass of all growing-stock trees greater than 5.0-inches d.b.h. from a 1-foot stump to a 4.0-inch top d.o.b. or to a point prior to 4.0-inch d.o.b. because of branching, forking, or other factors.

Residual Dry Weight—Dry weight of woody biomass of the nonmerchantable portion of all growing-stock trees greater than or equal to 5.0-inches d.b.h., all saplings, all noncommercial trees, all rough trees, and all rotten trees.

Total Dry Weight—Dry weight of woody biomass for all live woody vegetation greater than 1.0-inch d.b.h. Included are growing-stock, commercial, non-commercial, rough and rotten (sound portion) trees.

Woody Biomass—The amount of live organic material in woody vegetation. Included are bark and wood; excluded are fruits, leaves, stump, and roots.

Growth Classes

Gross Growth—Total increase in total stand volume computed on growing-stock trees. Gross growth equals survivor growth plus ingrowth plus growth on removals plus growth on mortality plus cull increment plus mortality.

Net Growth—Increase in total stand volume, computed on growing-stock trees. Net growth is equal to gross growth minus mortality.

Net Change—Increase or decrease in total stand volume, computed on growing-stock trees. Net change is equal to net growth minus removals.

Classes of Trees Used in Growth Computations

Survivor Trees—Merchantable-and-in at time 1 (previous inventory) and time 2 (current inventory).

Ingrowth Trees—Submerchantable-and-in at time 1 and merchantable-and-in at time 2.

Ongrowth Trees—Submerchantable-and-out at time 1 and merchantable-and-in at time 2; included with ingrowth component for growth computation.

Nongrowth Trees—Merchantable-and-out at time

1 and merchantable-and-in at time 2; included with survivor growth for growth computation.

Removal Trees—Merchantable-and-in at time 1 and removed prior to time 2.

Mortality Trees—Merchantable-and-in at time 1 and dead prior to time 2.

Miscellaneous Definitions

Basal Area—The area in square feet of the cross section at breast height of a single tree or of all the trees in a stand, usually expressed in square feet per acre.

Cull Increment—The change in growing-stock volume due to growing-stock, rough, or rotten trees changing tree class between time 1 and time 2.

D.b.h. (Diameter at breast height)—Tree diameter in inches, outside bark, usually measured at 4 1/2 feet above ground.

D.o.b. (Diameter outside bark)—Tree stem diameter in inches, outside bark.

Diameter Classes—The 2-inch diameter classes extend from 1.0 inch below to 0.9 inches above the stated midpoint. Thus, the 12-inch class includes trees 11.0 inches through 12.9 inches d.b.h.

FIA—Forest Inventory and Analysis unit of the U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station.

Log Grades—A classification of logs based on external characteristics as indicators of quality or value.

Mortality—Number or sound-wood volume of live trees dying from natural causes during a specified period.

Pine Stocking Class—A classification of timberland according to the degree of live pine tree stocking. Well-established pine seedlings are included, but must be at least 6 inches in height.

High stocking—stocked 60 percent or greater with pine.

Medium stocking—stocked 30 to 59 percent with pine.

Low stocking—stocked 0 to 29 percent with pine.

Pine Plantations—A classification of timberland according to the relative stocking of pine and hardwood species, and stand origin. Pines and redcedar must comprise the plurality of stocking and evidence of artificial origin must be present for classification as pine plantation. Included are longleaf-slash and loblolly-shortleaf stands showing evidence of artificial origin.

Saw-Log Portion—The point on the bole of a sawtimber tree between a 1-foot stump and the saw-log top.

Saw-Log Top—The point on the bole of a sawtimber tree above which a saw log cannot be pro-

duced. The minimum saw-log top is 7.0 inches d.o.b. for softwoods and 9.0 inches d.o.b. for hardwoods.

Site Class—A classification of forest land in terms of potential capacity to grow crops of industrial wood.

Timber Removals—The net volume of growing-stock trees removed from the inventory by harvesting or cultural operations such as timber stand improvement, land clearing, or change in land use.

Tree Grade—A log grade, assigned to the entire log portion of sawtimber trees, that is based upon the grade of the butt log portion only. In past surveys, a log grade was assigned to each upper log based upon log grade standards.

Upper-Stem Portion—That part of the main stem or fork of a sawtimber tree above the saw-log top to a d.o.b. of 4.0 inches or to a point where the main stem or fork breaks into limbs.

Species List

Scientific and common names of species² sampled in east Texas.³

Commercial Species

Genus	Species	Common Name
-------	---------	-------------

Softwoods

<i>Juniperus</i>	<i>silicicola</i>	southern redcedar
	<i>virginiana</i>	eastern redcedar
<i>Pinus</i>	<i>echinata</i>	shortleaf pine
	<i>elliottii</i>	slash pine
	<i>palustris</i>	longleaf pine
	<i>taeda</i>	loblolly pine
	<i>virginiana</i>	Virginia pine
<i>Taxodium</i>	<i>distichum</i> var.	
	<i>distichum</i>	baldcypress

Hardwoods

<i>Aesculus</i>	<i>glabra</i>	Ohio buckeye
<i>Acer</i>	<i>barbatum</i>	Florida maple
	<i>negundo</i>	boxelder
	<i>rubrum</i>	red maple
	<i>saccharinum</i>	silver maple
	<i>saccharum</i>	sugar maple

²Names according to: Little, Elbert L., Jr. Checklist of United States trees (native and naturalized). 1978. U.S. Department of Agriculture Handbook No. 541, 375 p.

³Trees less than 1.0-inches at d.b.h. are excluded.

<i>Castanea</i>	<i>pumila</i>	Allegheny chinkapin
<i>Catalpa</i>	sp.	catalpa
<i>Celtis</i>	<i>laevigata</i>	sugarberry
	<i>occidentalis</i>	hackberry
<i>Cornus</i>	<i>florida</i>	flowering dogwood
<i>Diospyros</i>	<i>virginiana</i>	common persimmon
<i>Fagus</i>	<i>grandifolia</i>	American beech
<i>Fraxinus</i>	<i>americana</i>	white ash
	<i>pennsylvanica</i>	green ash
	<i>profunda</i>	pumpkin ash
<i>Gleditsia</i>	<i>aquatica</i>	waterlocust
	<i>triancanthos</i>	honeylocust
<i>Halesia</i>	<i>carolina</i>	carolina silverbell
<i>Ilex</i>	<i>opaca</i>	American holly
<i>Juglans</i>	<i>nigra</i>	black walnut
<i>Liquidambar</i>	<i>styraciflua</i>	sweetgum
<i>Maclura</i>	<i>pomifera</i>	Osage-orange
<i>Magnolia</i>	<i>grandiflora</i>	southern magnolia
	<i>virginiana</i>	sweetbay
<i>Morus</i>	<i>rubra</i>	red mulberry
<i>Nyssa</i>	<i>aquatica</i>	water tupelo
	<i>sylvatica</i> var.	
	<i>bicolor</i>	swamp tupelo
	<i>sylvatica</i> var.	black tupelo,
	<i>sylvatica</i>	blackgum
<i>Persea</i>	<i>borbonia</i>	redbay
<i>Plantanus</i>	<i>occidentalis</i>	sycamore
<i>Populus</i>	sp.	cottonwood
<i>Prunus</i>	<i>serotina</i>	black cherry
<i>Quercus</i>	<i>alba</i>	white oak
	<i>bicolor</i>	swamp white oak
	<i>coccinea</i>	scarlet oak
	<i>falcata</i>	southern red oak
	<i>falcata</i> var.	
	<i>pagodifolia</i>	cherrybark oak
	<i>laurifolia</i>	laurel oak
	<i>lyrata</i>	overcup oak
	<i>macrocarpa</i>	bur oak
	<i>michauxii</i>	swamp chestnut oak
	<i>muehlenbergii</i>	chinkapin oak
	<i>nigra</i>	water oak
	<i>nuttallii</i>	Nuttall oak
	<i>phellos</i>	willow oak
	<i>prinus</i>	chestnut oak
	<i>shumardii</i>	Shumard oak
	<i>stellata</i> var.	
	<i>stellata</i>	post oak (typical)
	<i>velutina</i>	black oak
<i>Salix</i>	sp.	willow
<i>Sassafras</i>	<i>albidum</i>	sassafras
<i>Tilia</i>	<i>americana</i>	American basswood
<i>Betula</i>	<i>nigra</i>	river birch

<i>Carya</i>	sp.	hickory
	<i>aquatica</i>	water hickory
	<i>illinoensis</i>	pecan
<i>Ulmus</i>	<i>alata</i>	winged elm
	<i>americana</i>	American elm
	<i>crassifolia</i>	cedar elm
	<i>pumila</i>	Siberian elm
	<i>serotina</i>	September elm
	<i>rubra</i>	slippery elm

Noncommercial Species

Genus	Species	Common name
<i>Aesculus</i>	sp.	buckeye
<i>Bumelia</i>	sp.	bumelia

<i>Carpinus</i>	<i>caroliniana</i>	American hornbeam
<i>Castanea</i>	sp.	chinkapin
<i>Cercis</i>	<i>canadensis</i>	eastern redbud
<i>Crataegus</i>	sp.	hawthorn
<i>Melia</i>	<i>azedarach</i>	chinaberry
<i>Morus</i>	<i>alba</i>	white mulberry
<i>Ostrya</i>	<i>virginiana</i>	eastern hophornbeam
<i>Oxydendrum</i>	<i>arboreum</i>	sourwood
<i>Planera</i>	<i>aquatica</i>	water-elm
<i>Prosopis</i>	sp.	mesquite
<i>Prunus</i>	sp.	cherry, plum
<i>Quercus</i>	<i>incana</i>	bluejack oak
	<i>marilandica</i>	blackjack oak
	<i>virginiana</i>	live oak
<i>Vaccinium</i>	<i>arboreum</i>	tree sparkleberry

Standard Tables⁴

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⁴All tables exclude the Lost Pines.

Table 1.—Area by land classes, east Texas, 1986

Land class	Area
	<i>Thousand acres</i>
Forest	
Commercial	
Timberland	11,565.3
Deferred timberland	.....
Non-commercial	
Productive-reserved	119.7
Unproductive	114.5
Total forest	<u>11,799.5</u>
Nonforest	
Cropland ¹	3,482.2
Other	6,312.0
Total nonforest	<u>9,794.2</u>
All land ²	21,593.7

¹U.S. Department of Commerce, Bureau of the Census, 1982 Census of Agriculture, Volume 1: State and County data, issued 1984.

²Bureau of Census, 1981.

Table 2.—Area of timberland by ownership classes, east Texas, 1986¹

Ownership class	Area
	<i>Thousand acres</i>
Public:	
National Forest	610.3
Other federal	84.2
State	56.5
County	12.0
Total public	<u>762.9</u>
Private:	
Forest industry	3,795.5
Farmer	1,377.7
Miscellaneous private	
Individual	4,939.0
Corporate	690.1
Total private	<u>10,802.4</u>
All ownerships	11,565.3

¹Columns may not sum to totals due to rounding.

Table 3.—Area of timberland by stand size and ownership classes, east Texas, 1986¹

Stand size class	All ownerships	National Forest	Other public	Forest industry	Farmer	Miscellaneous private
	<i>Thousand acres</i>					
Sawtimber	5,715.1	485.7	82.1	1,561.7	626.1	2,959.5
Poletimber	2,813.3	43.2	46.8	699.8	505.7	1,517.8
Sapling and seedling	2,778.5	81.4	18.1	1,463.1	181.6	1,034.3
Nonstocked areas	258.5	.....	5.7	70.9	64.3	117.5
All classes	11,565.3	610.3	152.7	3,795.5	1,377.7	5,629.2

¹Rows and columns may not sum to totals due to rounding.

Table 4.—Area of timberland by stand volume and ownership classes, east Texas, 1986¹

Stand volume per acre	All ownerships	National Forest	Other public	Forest industry	Farmer	Miscellaneous private
<i>Board feet²</i>	<i>-----Thousand acres-----</i>					
Less than 1,500	4,491.6	93.8	35.3	1,841.7	635.2	1,885.6
1,500 to 5,000	3,227.7	66.7	59.4	738.3	467.1	1,896.2
More than 5,000	3,846.0	449.8	58.0	1,215.5	275.4	1,847.4
All classes	11,565.3	610.3	152.7	3,795.5	1,377.7	5,629.2

¹Rows and columns may not sum to totals due to rounding.²International 1/4-inch rule.Table 5.—Area of timberland by percent growing-stock trees and cull trees, east Texas, 1986¹

Growing-stock trees	Cull trees percent stocking							
	Total	0-10	10-20	20-30	30-40	40-50	50-60	60+
<i>Percent stocking</i>	<i>-----Thousand acres-----</i>							
0-10	110.3	5.7	5.9	.....	.....	7.3	35.2	56.1
10-20	215.2	5.2	12.2	17.3	30.2	19.1	18.8	112.4
20-30	400.7	5.5	18.1	19.3	37.7	48.5	73.1	198.5
30-40	743.5	12.2	25.8	67.7	121.2	191.3	140.9	184.4
40-50	920.2	23.2	65.8	54.0	166.4	194.8	171.7	244.2
50-60	1,181.0	53.0	113.6	154.7	248.1	290.8	219.4	101.5
60-70	1,434.7	46.1	118.8	331.6	411.5	320.8	157.4	48.5
70-80	1,582.5	165.3	330.7	466.5	323.6	206.7	66.3	23.3
80-90	1,457.9	187.9	370.4	466.3	282.6	94.7	36.7	19.3
90-100	1,274.5	232.2	417.1	410.5	185.0	29.6	.....	.....
100-110	961.6	299.0	349.5	198.8	83.3	25.0	5.9	.....
110-120	645.7	240.5	284.8	96.2	17.4	6.9	.....	.....
120-130	344.8	190.5	96.5	52.4	5.5	.....	.....	.....
130-140	240.7	156.7	66.9	17.1	.....	.....	.....	.....
140-150	35.0	35.0	.....	.....	.....	.....	.....	.....
150-160	11.2	11.2	.....	.....	.....	.....	.....	.....
160+	6.1	6.1	.....	.....	.....	.....	.....	.....
Total	11,565.3	1,675.2	2,276.2	2,352.3	1,912.4	1,435.6	925.4	988.2

¹Rows and columns may not sum to totals due to rounding.

Table 6.—Average basal area of live trees on timberland by ownership and timber classes, east Texas, 1986¹

Owner and timber classes	All species	Softwood			Hardwood		
		Sapling & seedling	Poletimber	Sawtimber	Sapling & seedling	Poletimber	Sawtimber
-----Square feet per acre-----							
National Forest:							
Growing stock	85.1	3.9	8.5	53.7	3.2	7.9	7.8
Rough and rotten	15.4	1.9	1.0	0.3	5.8	3.3	3.2
Total	100.6	5.8	9.5	54.0	9.0	11.2	11.1
Other public:							
Growing stock	71.9	2.5	4.3	25.1	5.3	17.5	17.1
Rough and rotten	21.8	1.7	0.2	0.8	8.1	4.2	6.8
Total	93.7	4.2	4.4	26.0	13.4	21.8	23.9
Forest industry:							
Growing stock	46.8	4.8	9.0	16.0	2.2	6.5	8.5
Rough and rotten	15.5	1.0	0.5	0.3	5.0	4.0	4.7
Total	62.3	5.8	9.5	16.2	7.2	10.5	13.1
Farmer:							
Growing stock	50.6	2.6	6.1	13.0	2.7	13.4	13.0
Rough and rotten	25.9	0.8	0.4	0.7	6.8	6.8	10.5
Total	76.6	3.4	6.5	13.7	9.5	20.2	23.4
Miscellaneous private:							
Growing stock	58.6	2.8	7.0	20.1	4.1	12.5	12.1
Rough and rotten	23.6	1.1	0.5	0.7	7.6	5.6	8.2
Total	82.2	3.9	7.5	20.8	11.7	18.1	20.2
All owners:							
Growing stock	55.4	3.5	7.6	19.7	3.3	10.5	10.8
Rough and rotten	20.8	1.1	0.5	0.5	6.6	5.1	7.0
Total	76.1	4.6	8.1	20.3	9.9	15.5	17.8

¹Rows and columns may not sum to totals due to rounding.Table 7.—Area of timberland by site and ownership classes, east Texas, 1986¹

Site class	All ownerships	National Forest	Other public	Forest industry	Farmer	Miscellaneous private
-----Thousand acres-----						
165 ft ³ or more	1,154.3	111.1	29.6	325.0	108.3	580.4
120 to 165 ft ³	3,187.8	246.8	41.8	1,194.8	224.0	1,480.3
85 to 120 ft ³	4,300.7	221.8	35.6	1,625.0	467.5	1,950.8
50 to 85 ft ³	2,450.4	30.5	27.9	609.2	434.1	1,348.7
Less than 50 ft ³	472.0	.....	17.8	41.6	143.7	269.0
All classes	11,565.3	610.3	152.7	3,795.5	1,377.7	5,629.2

¹Rows and columns may not sum to totals due to rounding.

Table 8.—Area of timberland by forest types and ownership classes, east Texas, 1986¹

Type	All ownerships	National Forest	Other public	Forest industry	Farmer	Miscellaneous private
-----Thousand acres-----						
Longleaf-slash pine	279.9	11.4	.....	220.7	12.3	35.5
Loblolly-shortleaf pine	3,936.6	433.7	44.4	1,463.5	272.9	1,722.2
Oak-pine	2,401.8	65.2	30.5	872.7	262.2	1,171.1
Oak-hickory	3,369.3	76.3	47.6	798.5	598.7	1,848.3
Oak-gum-cypress	1,519.1	23.7	24.3	440.1	219.7	811.3
Elm-ash-cottonwood	58.5	.....	5.9	.....	11.9	40.7
All types	11,565.3	610.3	152.7	3,795.5	1,377.7	5,629.2

¹Rows and columns may not sum to totals due to rounding.Table 9.—Area of noncommercial forest land by forest types, east Texas, 1986¹

Type	All areas	Productive reserved areas	Unproductive areas
-----Thousand acres-----			
Loblolly-shortleaf pine	54.9	54.9	.....
Oak-pine	24.9	24.9	.....
Oak-hickory	139.4	24.9	114.5
Oak-gum-cypress	15.0	15.0	.....
All types	234.2	119.7	114.5

¹Rows and columns may not sum to totals due to rounding.

Table 10.—Number of growing-stock trees on timberland by species and diameter classes, east Texas, 1986¹

Species	Diameter class (inches at breast height)										
	All classes	5.0– 6.9	7.0– 8.9	9.0– 10.9	11.0– 12.9	13.0– 14.9	15.0– 16.9	17.0– 18.9	19.0– 20.9	21.0– 28.9	29.0 and larger
<i>-----Thousand trees-----</i>											
Softwood:											
Longleaf pine	7,079	2,015	1,187	1,208	1,185	844	439	127	49	23	.....
Slash pine	32,925	14,376	11,536	3,881	1,983	806	288	.....	33	22	.....
Shortleaf pine	152,323	39,819	38,319	27,280	21,489	13,325	7,248	3,192	1,156	490	5
Loblolly pine	382,089	154,105	80,778	47,123	35,984	25,434	17,156	9,779	5,750	5,707	274
Redcedar	4,846	2,278	1,358	622	221	223	97	26	12	9	.....
Cypress	6,233	2,215	1,642	630	582	379	322	164	120	170	8
Total softwoods	585,495	214,808	134,819	80,745	61,444	41,010	25,549	13,288	7,121	6,422	288
Hardwood:											
Select white oaks ²	23,120	7,172	5,927	3,448	2,059	1,578	1,247	711	488	447	42
Select red oaks ³	13,752	4,742	2,532	2,229	1,212	1,148	454	471	346	504	113
Other white oaks	77,527	27,995	19,487	13,298	7,179	4,011	2,742	1,386	771	636	21
Other red oaks	114,934	34,507	27,930	20,096	11,448	8,352	5,498	3,149	1,765	1,994	194
Pecan	561	96	119	126	88	72	15	13	.....	33	.....
Water hickory	2,725	539	593	863	279	229	95	37	31	53	6
Other hickories	19,201	6,503	4,461	4,066	2,034	1,272	499	195	109	61	.....
Persimmon	691	268	229	124	49	22	.....	.....	.....	.....	.....
Hard maple	390	263	.....	82	31	.....	14	.....	.....	.....	.....
Soft maple	9,480	5,465	2,723	770	303	150	34	27	.....	8	.....
Boxelder	681	365	142	174	.....	.....	.....	.....	.....	.....	.....
Beech	1,541	122	214	237	271	298	206	112	48	32	.....
Sweetgum	130,667	57,784	34,230	20,038	9,450	4,944	1,930	1,035	753	453	50
Blackgum	22,232	8,442	6,224	2,994	1,859	1,245	813	306	141	208	.....
Other gums/ tupelos	2,508	472	701	292	276	311	224	149	65	17	.....
White ash	4,197	1,570	646	724	578	366	184	91	11	27	.....
Other ashes	9,588	3,148	2,834	1,374	908	721	267	239	54	34	9
Sycamore	1,356	331	312	244	173	63	70	17	40	102	4
Cottonwood	945	.....	114	242	223	84	96	118	51	12	4
Basswood	22	.....	.....	.....	.....	22	.....	.....	.....	.....	.....
Magnolia	806	150	56	244	117	121	76	25	11	6	.....
Sweetbay	2,492	663	1,066	454	244	41	16	.....	.....	8	.....
Willow	1,096	453	158	232	89	89	51	12	.....	7	4
Black walnut	285	.....	59	105	121	.....	.....	.....	.....	.....	.....
Black cherry	610	165	403	.....	29	.....	.....	12	.....	.....	.....
American elm	5,676	2,390	1,128	828	543	391	167	110	64	52	4
Other elms	30,092	14,576	7,692	4,089	1,690	1,209	505	229	49	54	.....
River birch	3,044	1,276	981	291	175	136	111	25	10	39	.....
Hackberry	7,490	3,158	2,031	979	538	328	261	128	19	47	.....
Other locusts	1,566	762	417	163	77	44	52	26	10	15	.....
Sassafras	1,955	1,420	315	123	63	18	17	.....	.....	.....	.....
Dogwood	798	726	73	.....	.....	.....	.....	.....	.....	.....	.....
Holly	3,419	2,305	792	209	93	20	.....	.....	.....	.....	.....
Other hardwoods	647	459	147	41	.....	.....	.....	.....	.....	.....	.....
Total hardwoods	496,094	188,288	124,736	79,180	42,202	27,283	15,645	8,623	4,836	4,850	452
All species	1,081,589	403,096	259,555	159,926	103,646	68,293	41,194	21,911	11,957	11,272	739

¹Rows and columns may not sum to totals due to rounding.²Includes white, swamp chestnut, and bur oaks.³Includes cherrybark, and Shumard oaks.

Table 11.—*Volume of timber on timberland by classes of timber and by softwoods and hardwoods, east Texas, 1986¹*

Class of timber	All species	Softwood	Hardwood
----- <i>Million cubic feet</i> -----			
Sawtimber trees:			
Saw-log portion	8,317.6	6,020.3	2,297.3
Upper-stem portion	868.2	499.6	368.6
Total	9,185.9	6,520.0	2,665.9
Poletimber trees	3,260.8	1,400.7	1,860.1
All growing stock	12,446.7	7,920.7	4,526.0
Rough trees	1,478.4	161.5	1,317.0
Rotten trees	306.9	12.8	294.1
Salvable dead trees	213.2	148.2	65.0
All timber	14,445.2	8,243.1	6,202.1

¹Rows and columns may not sum to totals due to rounding.

Table 12.—*Volume of growing stock and sawtimber on timberland by ownership classes and by softwoods and hardwoods, east Texas, 1986¹*

Ownership class	Growing stock			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
----- <i>Million cubic feet</i> -----				----- <i>Million board feet²</i> -----		
National Forest	1,391.9	1,201.9	190.0	7,389.0	6,781.7	607.3
Other public	221.0	125.2	95.8	945.1	671.2	274.0
Forest industry	3,412.5	2,276.0	1,136.5	13,734.9	9,877.3	3,857.6
Farmer	1,179.5	567.6	611.9	4,052.0	2,320.7	1,731.3
Miscellaneous private	6,241.8	3,750.1	2,491.8	24,373.0	17,070.5	7,302.4
All ownerships	12,446.7	7,920.7	4,526.0	50,493.9	36,721.3	13,772.6

¹Rows and columns may not sum to totals due to rounding.

²International 1/4-inch rule.

Table 13.—Volume of growing stock on timberland by detailed species and diameter classes, east Texas, 1986¹

Species	Diameter class (inches at breast height)										
	All classes	5.0– 6.9	7.0– 8.9	9.0– 10.9	11.0– 12.9	13.0– 14.9	15.0– 16.9	17.0– 18.9	19.0– 20.9	21.0 28.9	29.0 and larger
-----Million cubic feet-----											
Softwood:											
Longleaf pine	108.0	6.4	8.0	16.3	25.1	23.5	16.6	6.8	3.3	1.9	.....
Slash pine	239.5	39.4	73.2	50.5	40.6	22.7	10.4	.....	1.5	1.3	.....
Shortleaf pine	2,275.6	111.9	277.2	388.3	471.2	423.5	313.3	166.8	81.7	41.3	0.4
Loblolly pine	5,176.6	366.8	488.0	601.4	737.0	759.6	703.4	519.7	388.7	561.9	50.0
Redcedar	25.8	4.4	6.2	5.0	2.9	3.4	2.4	0.9	0.3	0.3	.....
Cypress	95.1	4.3	14.9	9.0	9.7	10.9	12.5	8.1	7.6	16.6	1.5
Total softwoods	7,920.7	533.2	867.5	1,070.5	1,286.5	1,243.6	1,058.7	702.3	483.1	623.3	51.9
Hardwood:											
Select white oaks ²	290.0	19.7	33.2	35.6	35.1	36.3	40.1	29.5	24.4	30.8	5.4
Select red oaks ³	205.7	12.8	13.6	21.8	20.6	27.5	13.9	19.0	18.1	41.4	17.1
Other white oaks	587.4	58.8	92.0	107.6	91.0	70.8	65.0	40.2	28.3	31.8	1.8
Other red oaks	1,338.3	88.2	152.8	201.4	180.2	187.9	162.3	125.6	85.2	132.5	22.3
Pecan	7.8	0.3	0.8	1.0	1.1	1.3	0.3	0.4	.....	2.5	.....
Water hickory	34.3	1.6	3.8	8.8	4.3	4.8	2.8	1.8	1.4	4.1	0.8
Other hickories	145.6	12.7	18.8	32.1	26.1	24.2	13.5	7.5	5.6	5.2	.....
Persimmon	4.0	0.6	1.1	1.2	0.7	0.3	.....	.....	.....	.....	.....
Hard maple	3.0	0.9	.....	0.9	0.7	.....	0.5	.....	.....	.....	.....
Soft maple	48.1	15.3	14.8	7.7	4.6	3.4	0.9	1.2	.....	0.3	.....
Boxelder	3.3	1.2	0.8	1.4	.....	.....	.....	.....	.....	.....	.....
Beech	31.1	0.3	1.0	2.7	3.6	7.3	6.2	5.1	2.9	2.0	.....
Sweetgum	1,014.8	128.0	192.7	210.7	161.9	124.5	66.2	45.6	42.2	35.4	7.7
Blackgum	197.6	20.1	31.8	30.6	29.7	28.4	23.2	12.1	7.0	14.7	.....
Other gums/ tupelos	37.1	1.2	3.5	2.8	4.7	7.4	7.0	6.4	3.2	0.9	.....
White ash	40.7	3.5	3.5	7.1	8.5	7.5	5.1	3.7	0.7	1.1	.....
Other ashes	88.1	7.2	15.9	14.6	14.5	15.7	7.5	8.2	2.1	1.8	0.7
Sycamore	25.2	1.1	1.8	2.3	3.2	1.0	2.8	0.3	1.9	10.3	0.4
Cottonwood	33.8	.....	1.4	4.2	7.8	3.3	4.7	7.0	3.5	1.2	0.7
Basswood	0.3	.....	.....	.....	.....	0.3	.....	.....	.....	.....	.....
Magnolia	11.9	0.4	0.4	2.3	1.6	2.7	2.5	1.1	0.6	0.5	.....
Sweetbay	18.3	2.0	6.5	4.0	3.6	1.0	0.5	.....	.....	0.7	.....
Willow	8.7	1.0	0.4	1.4	1.3	1.5	1.6	0.5	.....	0.5	0.6
Black walnut	2.5	.....	0.4	0.7	1.4	.....	.....	.....	.....	.....	.....
Black cherry	4.5	0.3	3.2	.....	0.5	.....	.....	0.5	.....	.....	.....
American elm	49.1	5.1	5.9	6.8	7.5	8.6	4.5	3.6	2.8	3.1	1.2
Other elms	182.8	31.3	39.0	36.0	25.7	24.1	13.4	7.8	2.1	3.3	.....
River birch	22.1	3.4	5.2	2.7	2.5	2.3	2.9	0.9	0.4	1.8	.....
Hackberry	54.2	7.2	9.7	7.8	7.1	6.6	7.5	4.5	1.0	2.8	.....
Other locusts	12.1	2.2	1.9	1.7	1.5	0.9	1.3	0.7	0.4	1.4	.....
Sassafras	7.2	2.8	1.8	1.2	0.9	0.2	0.3	.....	.....	.....	.....
Dogwood	1.5	1.3	0.3	.....	.....	.....	.....	.....	.....	.....	.....
Holly	13.4	5.4	3.9	2.2	1.4	0.5	.....	.....	.....	.....	.....
Other hardwoods	1.4	0.7	0.4	0.2	.....	.....	.....	.....	.....	.....	.....
Total hardwoods	4,526.0	436.5	662.1	761.5	653.4	600.2	456.5	333.0	234.0	330.0	58.8
All species	12,446.7	969.7	1,529.6	1,832.0	1,939.9	1,843.8	1,515.2	1,035.3	717.1	953.4	110.7

¹Rows and columns may not sum to totals due to rounding.²Includes white, swamp chestnut, and bur oaks.³Includes cherrybark, and Shumard oaks.

Table 14.—Volume of sawtimber on timberland by species and diameter classes, east Texas, 1986¹

Species	Diameter class (inches at breast height)								
	All classes	9.0— 10.9	11.0— 12.9	13.0— 14.9	15.0— 16.9	17.0— 18.9	19.0— 20.9	21.0— 28.9	29.0 and larger
-----Million board feet ⁴ -----									
Softwood:									
Longleaf pine	508.4	72.5	136.8	130.8	95.5	41.6	19.6	11.6	.....
Slash pine	643.8	222.0	218.6	129.3	57.5	.....	8.2	8.3	.....
Shortleaf pine	10,737.8	1,842.6	2,644.7	2,521.9	1,918.4	1,024.0	522.9	260.9	2.4
Loblolly pine	24,390.0	2,658.4	3,952.0	4,336.3	4,154.1	3,113.1	2,364.6	3,485.4	326.1
Redcedar	65.0	18.5	12.2	15.4	12.3	4.7	1.0	1.1	.....
Cypress	376.3	23.8	38.6	55.3	66.2	45.6	41.1	95.6	10.2
Total softwoods	36,721.3	4,837.7	7,002.8	7,188.9	6,304.0	4,229.0	2,957.4	3,862.8	338.7
Hardwood:									
Select white oaks ²	1,093.6	.....	162.8	182.3	217.7	178.2	141.2	177.3	34.0
Select red oaks ³	845.2	.....	76.5	134.7	73.2	105.1	102.6	248.7	104.4
Other white oaks	1,733.5	.....	418.4	371.6	347.4	225.2	169.4	189.7	11.8
Other red oaks	4,669.0	.....	749.5	929.9	866.4	691.6	490.0	801.4	140.0
Pecan	29.4	.....	4.3	7.0	0.9	2.9	.....	14.3	.....
Water hickory	115.2	.....	22.7	23.5	16.7	11.8	8.2	26.4	5.9
Other hickories	428.7	.....	121.1	124.4	77.1	41.5	33.3	31.4	.....
Persimmon	4.6	.....	2.7	1.9	.....	.....	.....	.....	.....
Hard maple	6.5	.....	3.7	.....	2.8	.....	.....	.....	.....
Soft maple	47.4	.....	20.3	14.5	4.3	6.2	.....	2.2	.....
Beech	153.0	.....	16.5	39.3	35.7	32.2	17.8	11.5	.....
Sweetgum	2,354.0	.....	617.8	613.3	363.2	258.5	241.8	211.9	47.4
Blackgum	578.5	.....	118.6	139.2	122.5	69.3	40.9	88.0	.....
Other gums/tupelos	137.9	.....	16.3	32.1	34.9	31.5	17.9	5.1	.....
White ash	132.2	.....	38.3	37.0	26.6	19.1	4.7	6.5	.....
Other ashes	229.7	.....	54.9	72.1	36.9	40.3	10.9	10.8	3.9
Sycamore	111.5	.....	13.2	4.5	15.2	1.3	10.4	64.5	2.3
Cottonwood	181.8	.....	56.7	21.2	29.7	43.0	19.9	7.1	4.1
Basswood	1.4	.....	.....	1.4	.....	.....	.....	.....	.....
Magnolia	47.2	.....	6.5	14.8	12.5	6.7	3.7	3.0	.....
Sweetbay	26.4	.....	15.0	4.7	2.6	.....	.....	4.0	.....
Willow	29.9	.....	5.1	7.3	9.0	2.5	.....	2.6	3.4
Black walnut	6.5	.....	6.5	.....	.....	.....	.....	.....	.....
Black cherry	6.3	.....	3.2	.....	.....	3.1	.....	.....	.....
American elm	162.5	.....	31.4	45.2	22.8	18.2	16.0	19.0	9.9
Other elms	401.0	.....	123.3	124.6	72.5	46.3	14.0	20.3	.....
River birch	50.2	.....	8.8	9.6	14.5	4.4	2.2	10.7	.....
Hackberry	141.4	.....	31.1	31.0	36.2	22.1	5.9	15.1	.....
Other locusts	32.9	.....	6.9	5.1	6.0	4.1	2.9	8.0	.....
Sassafras	6.3	.....	3.8	1.1	1.5	.....	.....	.....	.....
Holly	8.9	.....	6.5	2.3	.....	.....	.....	.....	.....
Total hardwoods	13,772.6	.....	2,762.3	2,995.8	2,449.1	1,865.1	1,353.6	1,979.4	367.3
All species	50,493.9	4,837.7	9,765.1	10,184.7	8,753.0	6,094.1	4,311.0	5,842.2	706.0

¹Rows and columns may not sum to totals due to rounding.²Includes white and swamp chestnut oaks.³Includes cherrybark and Shumard oaks.⁴International 1/4-inch rule.

Table 15.—*Volume of sawtimber on timberland by species and tree grade, east Texas, 1986¹*

Species	All grades	Grade 1	Grade 2	Grade 3	Grade 4
-----Million board feet ³ -----					
Softwood:					
Yellow pines	36,280.0	6,142.3	7,858.4	22,279.3	.....
Cypress	376.3	115.0	123.5	137.8	.....
Redcedar	65.0	65.0	.....	.....	.....
Total softwoods	36,721.3	6,322.4	7,981.9	22,417.1	.....
Hardwood:					
Select white and red oaks ²	1,938.8	212.9	374.9	810.2	540.9
Other white and red oaks	6,402.5	214.6	744.2	2,674.1	2,769.6
Hickory	573.3	39.9	73.5	266.7	193.3
Hard maple	6.5	.....	.....	.....	6.5
Sweetgum	2,354.0	186.0	408.6	1,106.2	653.1
Tupelo and blackgum	716.4	93.3	227.0	276.9	119.2
Ash, walnut and black cherry	374.7	42.3	120.8	194.4	17.3
Other hardwoods	1,406.3	111.0	225.6	646.0	423.8
Total hardwoods	13,772.6	899.9	2,174.4	5,974.5	4,723.7
All species	50,493.9	7,222.3	10,156.3	28,391.5	4,723.7

¹Rows and columns may not sum to totals due to rounding.²Includes white, swamp chestnut, cherrybark, and Shumard oaks.³International 1/4-inch rule.Table 16.—*Periodic net annual growth and removals of growing stock on timberland by species, east Texas, 1975–1986¹*

Species	Periodic net annual growth	Periodic annual removals
-----Million cubic feet-----		
Softwood:		
Yellow pines	459.9	478.9
Cypress	2.6	0.1
Redcedar	0.7	0.3
Total softwoods	463.2	479.2
Hardwood:		
Select white and red oaks ²	22.2	16.8
Other white and red oaks	70.1	63.9
Hickory	4.4	7.2
Hard maple	.....	0.1
Sweetgum	39.8	27.0
Tupelo and blackgum	6.7	5.4
Ash, walnut and black cherry	5.2	2.8
Other hardwoods	15.2	9.6
Total hardwoods	163.6	132.8
All species	626.8	612.0

¹Columns may not sum to totals due to rounding.²Includes white, swamp chestnut, bur, cherrybark, Shumard oaks.

Table 17.—*Periodic net annual growth and removals of growing stock on timberland by ownership classes and by softwoods and hardwoods, east Texas, 1975–1986*¹

Ownership class	Periodic net annual growth			Periodic annual removals		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
----- <i>Million cubic feet</i> -----						
National Forest	44.1	38.8	5.4	30.1	28.1	2.1
Other public	8.0	4.5	3.5	4.4	2.2	2.2
Forest industry	209.4	163.2	46.1	298.7	241.6	57.1
Farmer	58.7	37.9	20.8	47.5	31.9	15.6
Miscellaneous private	306.6	218.7	87.8	231.3	175.5	55.8
All ownerships	626.8	463.2	163.6	612.0	479.2	132.8

¹Rows and columns may not sum to totals due to rounding.

Table 18.—*Periodic net annual growth and removals of sawtimber on timberland by species, east Texas, 1975–1986*¹

Species	Periodic net annual growth	Periodic annual removals
----- <i>Million board feet</i> -----		
Softwood:		
Yellow pines	2,339.7	2,056.0
Cypress	12.9	0.6
Redcedar	2.1	0.4
Total softwoods	2,354.7	2,057.0
Hardwood:		
Select white and red oaks ²	89.1	56.2
Other white and red oaks	300.4	187.5
Hickory	17.8	17.9
Sweetgum	100.7	64.9
Tupelo and blackgum	25.4	12.3
Ash, walnut and black cherry	19.1	9.6
Other hardwoods	54.8	22.3
Total hardwoods	607.5	370.6
All species	2,962.1	2,427.6

¹Columns may not sum to totals due to rounding.

²Includes white, swamp chestnut, cherrybark, and Shumard oaks.

³International 1/4-inch rule.

Table 19.—*Periodic net annual growth and removals of sawtimber on timberland by ownership classes and by softwoods and hardwoods, east Texas, 1975–1986*¹

Ownership class	Periodic net annual growth			Periodic annual removals		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
----- <i>Million board feet</i> ² -----						
National Forest	282.5	260.0	22.5	141.1	134.9	6.2
Other public	38.0	26.7	11.3	17.2	10.0	7.2
Forest industry	900.9	725.2	175.7	1,232.5	1,083.2	149.3
Farmer	251.5	179.7	71.8	167.9	122.5	45.4
Miscellaneous private	1,489.1	1,163.0	326.1	868.9	706.4	162.5
All ownerships	2,962.1	2,354.7	607.5	2,427.6	2,057.0	370.6

¹Rows and columns may not sum to totals due to rounding.

²International 1/4-inch rule.

Table 20.—*Periodic annual mortality of growing stock and sawtimber on timberland by species, east Texas, 1975–1986*¹

Species	Growing stock	Sawtimber
	<i>Million cubic feet</i>	<i>Million board feet</i> ²
Softwood:		
Yellow pines	55.8	194.0
Cypress	0.1	0.4
Redcedar	0.4	1.6
Total softwoods	56.3	195.9
Hardwood:		
Select white and red oaks ³	2.9	9.2
Other white and red oaks	18.6	59.3
Hickory	2.6	6.7
Sweetgum	6.3	13.8
Tupelo and blackgum	0.9	2.5
Ash, walnut and black cherry	0.9	2.6
Other hardwoods	8.2	20.2
Total hardwoods	40.3	114.2
All species	96.7	310.1

¹Columns may not sum to totals due to rounding.

²International 1/4-inch rule.

³Includes white, swamp chestnut, bur, cherrybark, and Shumard oaks.

Table 21.—*Periodic annual mortality of growing stock and sawtimber on timberland by ownership classes and by softwoods and hardwoods, east Texas, 1975–1986*¹

Ownership class	Growing stock			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	----- <i>Million cubic feet</i> -----			----- <i>Million board feet</i> ² -----		
National Forest	9.7	8.2	1.5	35.9	31.6	4.2
Other public	0.7	0.4	0.4	2.8	1.3	1.5
Forest industry	26.0	15.9	10.1	88.2	56.4	31.8
Farmer	10.7	5.7	5.0	34.3	17.1	17.2
Miscellaneous private	49.5	26.1	23.4	148.9	89.5	59.5
All ownerships	96.7	56.3	40.3	310.1	195.9	114.2

¹Rows and columns may not sum to totals due to rounding.

²International 1/4-inch rule.

Table 22.—*Periodic annual mortality of growing stock and sawtimber on timberland by causes of death and by softwoods and hardwoods, east Texas, 1975–1986*¹

Ownership class	Growing stock			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	----- <i>Million cubic feet</i> -----			----- <i>Million board feet</i> ² -----		
Bark beetles	22.5	22.5	.....	92.1	92.1	.....
Other insects	1.1	0.9	0.2	3.5	2.4	1.1
Disease	46.2	18.6	27.7	137.0	63.2	73.8
Fire	1.2	0.8	0.4	0.8	0.6	0.2
Beaver	1.3	.....	1.3	3.3	.....	3.3
Weather	11.1	4.7	6.4	44.3	21.0	23.4
Hurricane	1.3	0.4	0.9	6.0	1.4	4.6
Suppression	5.3	4.4	0.9	1.3	1.0	0.3
Other	6.7	4.1	2.6	21.7	14.1	7.6
All causes	96.7	56.3	40.3	310.1	195.9	114.2

¹Rows and columns may not sum to totals due to rounding.

²International 1/4-inch rule.



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This report presents the principal findings of the fifth forest survey of east Texas (1986) and changes that have occurred since earlier surveys. Topics examined include the status and trends in forest area, timber volume, growth, removals, mortality, and timber products output.

Additional keywords: forest inventory, timberland, volume, biomass, timber supply, Lost Pines.







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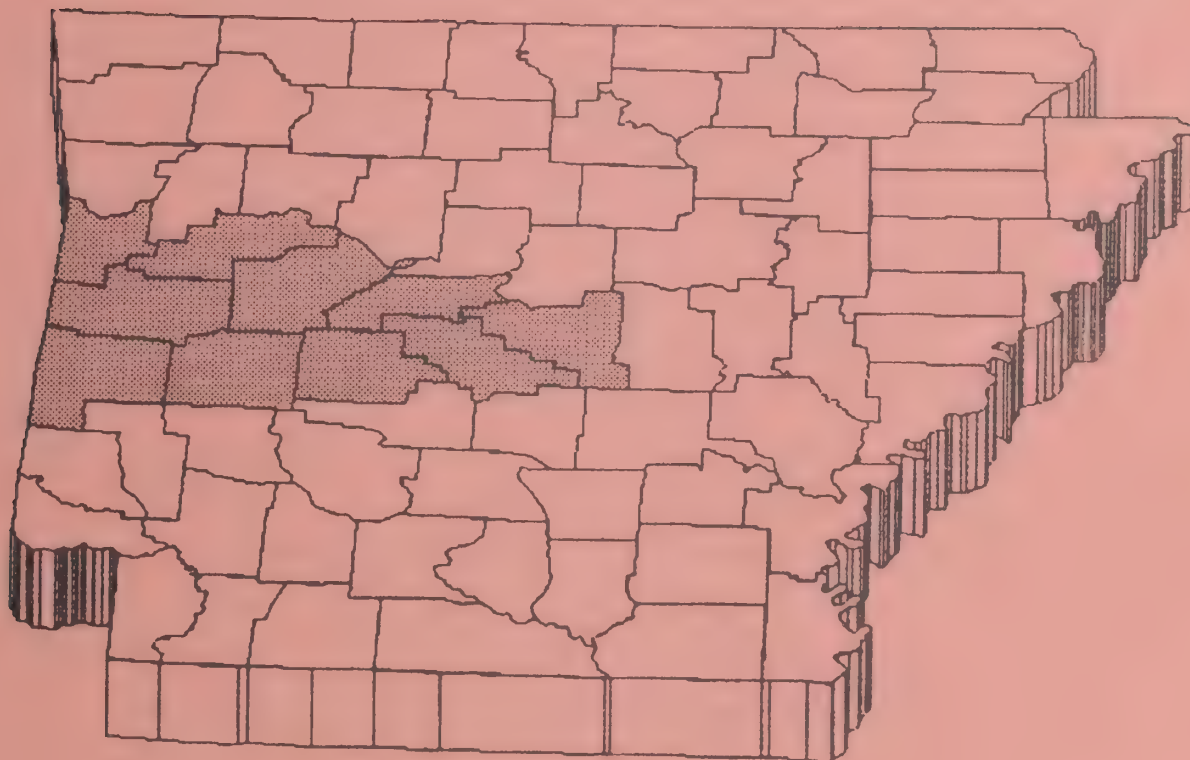
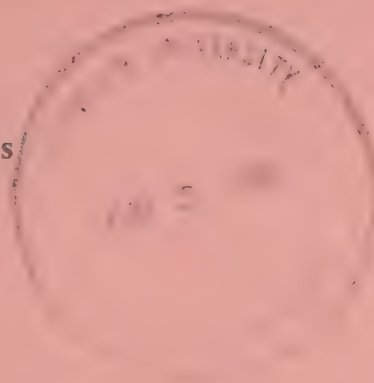
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Forest Statistics for Arkansas' Ouachita Counties - 1988

F. Dee Hines



SUMMARY

The 1988 survey of the Ouachita Unit of Arkansas shows some constants and some changes since the 1978 survey.

- Timberland area now covers 3172.2 thousand acres, about the same as it was in 1978.
- Ownership patterns are relatively unchanged except for other publicly owned timberland, which increased 21 percent.
- Area covered by the loblolly-shortleaf forest type declined 14 percent.
- Oak-pine forest types showed a 5-percent decrease in acreage.
- Oak-hickory forest types increased by 17 percent.
- Sawtimber and poletimber stands decreased by 6 percent each, sapling-seedling stands increased 9 percent.
- Plantation acreage is up 153 percent to 451.4 thousand acres.
- Softwood volumes have decreased; 13 percent for growing stock, 6 percent for sawtimber.
- Hardwood volumes have increased; 19 percent for growing stock, 38 percent for sawtimber.
- For softwoods, removals exceed growth for growing stock and sawtimber.
- Hardwood growth on growing stock and sawtimber is up.
- Removals of hardwood, both growing stock and sawtimber, have increased, but remain less than growth.
- Total mortality estimates are up over 100 percent.

FOREWORD

The Southern Forest Survey, an activity of the Southern Forest Experiment Station Forest Inventory and Analysis work unit, covers the States of Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, Tennessee, and East Texas, and the island of Puerto Rico.

This survey is part of the nationwide Forest Survey originally authorized by the McSweeney-McNary Act of 1928. More recent legislation pertinent to the survey mission includes the Forest and Rangeland Renewable Resources Planning Act of 1974 and the Forest and Rangeland Renewable Resources Research Act of 1978. The survey mission is to develop, analyze, and maintain renewable forest resource information. This information is essential for formulation of forest policies and programs.

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*Core tables are presented in response to the Southern Industrial Forestry Research Council's recommendations. These tables are identical among Forest Inventory and Analysis units in the eastern United States.



Figure I.—The forest survey regions of Arkansas.

Forest Statistics for Arkansas' Ouachita Counties—1988

F. Dee Hines

INTRODUCTION

Tabulated results were derived from data obtained during a recent inventory of 10 counties comprising the Ouachita Unit of Arkansas (fig. 1). Data on forest acreage and timber volume were secured by a three-step process. A forest-nonforest classification using aerial photographs was accomplished for points representing approximately 230 acres. These photo classifications were adjusted based on ground observations at sample locations representing approximately 3,840 acres. Finally, field measurements were made at forest locations on the intersections of grid lines spaced 3 miles apart. At these forest locations, per-acre estimates were obtained from trees measured on ten 37.5 basal area factor prism points.

The sampling methods were designed to achieve suitable sampling errors for estimates of area and volume at the State level. Sampling error increases as the area or volume considered decreases. The sampling errors presented in table I, equal to one standard deviation for the sample

data, may be used to construct confidence intervals for population parameters. For example, at the 95 percent confidence level, the confidence interval for growing-stock volume (in million cubic feet) in the Ouachita region of Arkansas (with a sampling error of 3.2 percent) is

$$3,369.6 \pm 1.96(0.032 \times 3,369.6) = 3,369.6 \pm 211.3$$

where 1.96 is the number of standard deviations. This confidence interval indicates that the actual growing-stock volume lies in the range 3158.3 to 3580.9 million cubic feet, unless a 1 in 20 chance has occurred.

Sampling errors for sub-groups of counties in the unit may be estimated by the following formula:

$$SE_g = \frac{SE_t \sqrt{X_t}}{\sqrt{X_g}}$$

where:

SE = standard error of estimate
(expressed as a percent)

Table I—Sampling errors¹ for timberland, growing stock, and sawtimber, Ouachita Counties, Arkansas, 1988

County	Timberland	Growing stock			Sawtimber Volume
		Volume	Growth	Removals	
----- <i>Percent</i> -----					
Garland	1.9	9.4	12.5	18.0	11.6
Logan	2.2	13.4	16.4	37.1	16.2
Montgomery	1.4	8.0	10.2	18.0	10.9
Perry	2.0	10.8	13.8	16.1	12.7
Polk	2.1	8.4	9.6	19.2	11.6
Pulaski	1.7	10.8	18.0	21.4	13.1
Saline	2.1	9.0	11.3	13.1	10.6
Scott	1.8	5.8	8.6	16.3	7.6
Sebastian	2.6	13.8	(2)	42.8	19.7
Yell	1.5	10.6	9.8	21.2	10.9
All counties	0.6	3.2	4.0	6.6	3.9

¹By random-sampling formula.

²Sampling error greater than 50.

X = variable of interest
(area or volume)
g = group of counties to be combined
t = total for the unit.

For example, the sampling error estimate of growing-stock volume for Montgomery, Polk, and Scott counties is 4.6 percent. Thus, the 95 percent confidence interval for growing-stock volume is 1615.4 ± 145.6 million cubic feet.

Ownership information is obtained by the same systematic sample outlined above. County courthouse records are used to obtain ownership information for each forested plot. An expansion factor representing timberland area in that county is then applied to the ownership group the plot represents. Next, the ownership groups are totaled for each county. Thus, acreages reported at the county level are estimates and may not exactly match known totals for each ownership category within that county.

In order to achieve greater compatibility among Forest Inventory and Analysis Projects, a new tree grading classification has been initiated for the 1988 Arkansas survey. Tree grade 5 is used for trees currently or prospectively capable of producing at least one 12-foot log or two 8-foot logs in the saw-log portion but not able to produce a 12-foot log in the butt 16 feet. These trees, formerly classed as rough or rotten, are now included in growing stock. Table II shows the impact of this change on volume and growth.

For comparative purposes 1978 survey data were reprocessed using current procedures. Therefore, differences between 1978 and 1988 data should reflect resource changes and not data processing differences. Results from the reprocessed 1978 data are used for comparison to 1988 data in the Highlights that follow.

HIGHLIGHTS

Timberland Area

The Ouachita Unit of Arkansas is now 68-percent forested. Of this forest land, 3172.2 thousand acres are classified as timberland. This is a nonsignificant decline of 2 percent since the previous survey of 1978. Although land use changes have occurred, the timberland acreage base seems to have stabilized over this survey cycle.

Acreage estimates in the various ownership groups remained relatively unchanged since the previous survey. The National Forest System is the largest ownership category in this unit of Arkansas with 1308.7 thousand acres or 41 percent of the timberland total. Only other publicly owned land showed a significant change, up 21 percent to 173.9 thousand acres. Forest industry-owned land, including that under long-term lease, and other privately owned land did not change significantly.

Table II—Changes in volume and growth estimates due to inclusion of tree grade 5 in growing-stock inventory, Ouachita Counties, Arkansas, 1988

	Tree grade 5		
	Excluded from growing stock	Included in growing stock	Percent change
<i>----- Million cubic feet -----</i>			
Softwood:			
Growing-stock volume	2040.9	2050.5	.5
Rough and rotten volume	51.8	42.2	-18.5
Growing-stock growth	62.8	63.7	1.4
Hardwood:			
Growing-stock volume	1270.8	1319.0	3.8
Rough and rotten volume	309.7	261.5	-15.6
Growing-stock growth	39.8	44.9	12.8
<i>----- Million board feet -----</i>			
Softwood:			
Sawtimber volume	8456.5	8488.2	.4
Sawtimber growth	350.4	353.5	.9
Hardwood:			
Sawtimber volume	2811.4	2998.6	6.7
Sawtimber growth	115.8	135.4	16.9

Changes in several forest types have occurred since the 1978 survey. The loblolly-shortleaf type decreased from 1204.1 to 1033.9 thousand acres. Oak-pine and bottomland hardwood forest types are both down 5 percent. The oak-pine type has 832.8 thousand acres while 191.9 thousand acres are classified as bottomland hardwood. The bottomland hardwood group includes oak-gum-cypress and elm-ash-cottonwood forest types. Only the oak-hickory forest type showed an increase in acreage. This group is up to 1113.6 thousand acres, a 17-percent increase.

Older sawtimber and poletimber stands are being replaced by younger sapling-seedling stands. Both sawtimber and poletimber stands decreased by 6 percent. Sawtimber stands now occupy 1233.0 thousand acres, while poletimber stands cover 1079.8 thousand acres. Sapling-seedling stands increased in area by 9 percent and now occupy 836.7 thousand acres. While these shifts are small, the trend is also seen by an increase in plantation acreage. Plantations now cover 451.4 thousand acres, up 153 percent from 178.3 thousand acres in 1978.

Number of Trees

The total number of live trees is down 16 percent in the Ouachita Unit. Softwood live tree total numbers are 14 percent below the 1978 estimate. All diameter classes show a decrease except the 20-inch class where an increase is seen. The total number of live hardwood trees has also decreased, down 17 percent. However, with hardwood live trees, the 10-inch and all diameter classes over 14 inches show an increase in numbers.

An even greater decrease in total numbers is seen for growing-stock trees. Here, the total number of growing-stock trees is 39 percent lower than the previous estimate. The total number of softwood growing-stock trees has decreased by 21 percent. All softwood diameter classes below 20 inches suffered losses. Similarly, hardwood growing-stock trees dropped 49 percent over the survey period. This decrease was entirely below the 8-inch diameter class. All other hardwood diameter classes showed an increase in total numbers.

Timber Volume

Softwood timber volumes have declined since the 1978 survey. The current estimate of softwood growing-stock volume is 13 percent less than the 2352.0 million cubic feet recorded during the previous survey. This is contrary to the 8-percent increase in growing-stock volume that occurred between 1969 and 1978. Similarly, softwood sawtimber volume increased 17 percent from 1969 to 1978, but has decreased 6 percent since 1978. The current estimate is 8488.2 million board feet.

Contrary to softwood volumes, hardwood volumes have shown an increase since the last survey. In 1978 hardwood growing-stock volume was estimated at 1105.5 million cubic feet, 16-percent greater than the 1969 survey figure. Today growing-stock volume of hardwood is 1319.0 million cubic feet, another 19-percent increase. The same pattern is seen in sawtimber volume. The 1969 estimate of 1941.6 million board feet increased to 2172.2 million board feet in 1978. A 38-percent increase in sawtimber volume since the last survey yields the 1988 estimate of 2998.6 million board feet.

Growth, Removals, and Mortality

Total average net annual growth of growing stock decreased 22 percent. This decrease is due to a 35-percent decline in softwood net annual growth. The current estimate of softwood growth is 63.7 million cubic feet. Conversely, hardwood net annual growth of growing stock has increased 6 percent to 44.9 million cubic feet.

Average net annual growth of sawtimber follows a similar pattern, decreasing by 5 percent. Softwood sawtimber growth is off 19 percent from the 1978 estimate. It is now estimated at 353.5 million board feet annually. However, net annual growth of hardwood sawtimber is 135.4 million board feet. This is a 70-percent increase over the previous estimate of 79.8 million board feet.

Softwood average annual removals show a very large increase over previous levels. Removals of softwood growing stock are up 32 percent to 95.3 million cubic feet. Softwood sawtimber removals are currently estimated at 402.7 million board feet, or 46 percent greater than the 1978 figure.

As with softwood removals, average annual removals of hardwood are up, though to a lesser degree. Growing-stock removals are up 8 percent to 25.6 million cubic feet. Removals of hardwood sawtimber increased to 50.3 million board feet. However, this is only a 4-percent increase from the last survey.

The sharp decrease in average annual growth of softwoods combined with the increase in average annual removals of softwoods has created a situation of some concern. Total average annual removals exceed total average annual growth of growing stock. This could have serious implications upon future softwood supplies for the Ouachita area.

Ouachita mortality estimates have increased since 1978. Growing-stock mortality is currently estimated at 22.1 million cubic feet, a jump of 110 percent. The current survey also shows sawtimber mortality up 125 percent to 49.9 million board feet.

Tables 1-25 were developed to provide comparability among Forest Inventory and Analysis Projects. Tables 26-35 are supplementary tables and may change from unit to unit or State to State to address specific resource issues.

DEFINITION OF TERMS

Average net annual growth.—Average net annual volume increase for the inter-survey period.

Average annual mortality.—Average annual sound-wood volume of growing-stock trees dying from natural causes.

Average annual removals.—Average net annual volume of growing-stock trees removed from the inventory by harvesting, cultural operations (such as timber-stand improvement), land clearing, or changes in land use.

Commercial species.—Tree species which normally develop into trees suitable for industrial wood products.

Forest type.—A classification of forest land based upon the species forming a plurality of live-tree stocking.

Growing-stock trees.—Live trees of commercial species. Rough and rotten trees are excluded.

Growing-stock volume.—The cubic-foot volume of sound wood in growing-stock trees at least 5.0 inches in diameter at breast height, from a 1-foot stump to a minimum 4.0-inch top diameter outside bark of the central stem, or to the point where the central stem breaks into limbs.

Live trees.—Commercial and noncommercial tree species of sapling size or larger.

Natural stands.—Stands with no evidence of artificial regeneration. This includes those established by seed tree regeneration methods.

Noncommercial species.—Tree species of typically small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products.

Planted stands.—Stands with some evidence of planting or direct seeding.

Poletimber trees.—Growing-stock trees at least 5.0 inches in diameter at breast height, but smaller than sawtimber size.

Reserved timberland.—Productive public forest land withdrawn from timber utilization through statute or administrative regulations.

Rotten trees.—Live trees of commercial species that do not contain at least one 12-foot log or two 8-foot logs in the saw-log portion, now or prospectively, primarily because of rot.

Rough trees.—Live trees of commercial species that do not contain at least one 12-foot log or two 8-foot logs in the saw-log portion, now or prospectively, primarily because of roughness or poor form. Also included are all live trees of noncommercial species.

Saplings.—Growing-stock trees at least 1.0 inches but less than 5.0 inches in diameter at breast height.

Sawtimber trees.—Live trees that contain at least one 12-foot log, or two 8-foot logs in the saw-log portion, and meet regional specifications for freedom from defect. Softwoods must be at least 9.0 inches in diameter at breast height and hardwoods at least 11.0 inches in diameter at breast height.

Sawtimber volume.—Sound-wood volume of the saw-log portion of growing-stock sawtimber trees in board feet, International 1/4-inch rule and in cubic feet.

Seedlings.—Growing-stock trees less than 1.0 inches in diameter at breast height and greater than one foot tall for hardwoods, greater than six

inches tall for softwoods, and greater than one-half inch in diameter at ground level for longleaf pine.

Select red oaks.—A classification of several red oak species composed of: cherrybark, Shumard, and northern red oaks.

Select white oaks.—A classification of several white oak species composed of: white, swamp chestnut, swamp white, chinkapin, Durand, and bur oaks.

Site class.—A classification of forest land in terms of inherent capacity to grow crops of industrial wood.

Stand-size class.—A classification of forest land based on the diameter size class of growing-stock

trees on the sampled area; that is, sawtimber, poletimber, or sapling and seedling.

Timberland.—Forest land that is producing, or is capable of producing, crops of industrial wood and not withdrawn from timber utilization. Timberland is synonymous with "commercial forest land" in prior reports.

Tree grade.—A classification of the volume of the saw-log portion of sawtimber trees, based on: 1) the log grade of the butt log, or 2) ability to produce at least one 12-foot or two 8-foot logs in the upper-section of the saw-log portion.

Woodland.—Forest land incapable of yielding crops of industrial wood because of adverse site conditions.

Core Tables 1-25

Table 1—Area by county and land class, Ouachita Counties, Arkansas, 1988

County	All land ¹	Forest land			Reserved timberland	Nonforest land
		Total	Timberland ²	Woodland ³		
----- <i>Thousand acres</i> -----						
Garland	420.4	333.7	328.9	...	4.8	86.7
Logan	448.9	252.9	242.1	6.1	4.7	196.0
Montgomery	495.7	413.4	413.4	...	...	82.2
Perry	352.3	263.8	260.8	...	3.0	88.4
Polk	550.6	408.9	381.6	5.5	21.8	141.7
Pulaski	490.8	201.8	201.8	...	...	289.0
Saline	464.1	356.8	349.7	...	7.1	107.3
Scott	573.7	448.2	442.7	...	5.5	125.6
Sebastian	342.3	156.3	149.6	...	6.7	186.1
Yell	595.4	402.0	401.5	...	0.5	193.4
All counties	4734.2	3237.8	3172.2	11.5	54.1	1496.4

¹From U.S. Bureau of the Census.

²Forest land (formerly termed commercial forest land) that is producing or capable of producing at least 20 cubic feet of industrial wood per acre per year. Includes areas which may be inaccessible or inoperable by current standards. Excludes reserved timberlands.

³Forest land incapable of producing 20 cubic feet of industrial wood per acre per year under natural conditions because of adverse site conditions.

Table 2—Area of timberland by county and land class, Ouachita Counties, Arkansas, 1988

County	All ownerships	National forest	Misc. federal	State	County and municipal	Forest industry ¹	Farmer	Corporate ²	Individual ²
----- Thousand acres -----									
Garland	328.9	97.1	5.4	...	5.4	118.6	...	16.2	86.3
Logan	242.1	90.8	24.2	...	...	12.1	24.2	6.1	84.7
Montgomery	413.4	307.1	5.9	...	...	53.2	11.8	5.9	29.5
Perry	260.8	70.6	...	5.4	...	135.8	21.7	5.4	21.7
Polk	381.6	158.1	...	5.5	16.4	81.8	27.3	5.5	87.2
Pulaski	201.8	...	25.9	...	...	41.4	25.9	51.7	56.9
Saline	349.7	27.8	...	...	5.6	172.1	16.7	27.8	99.9
Scott	442.7	356.4	...	...	...	5.7	5.7	11.5	63.2
Sebastian	149.6	...	45.5	...	6.5	...	32.5	6.5	58.5
Yell	401.5	200.8	11.2	11.2	...	78.1	50.2	...	50.2
All counties	3172.2	1308.7	118.1	22.0	33.8	698.8	216.0	136.5	638.3

¹Includes land leased to forest industry.

²Indian land will be classed as corporate or individual as defined by the Bureau of Indian Affairs.

Table 3—Area of timberland by county and forest type group, Ouachita Counties, Arkansas, 1988

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak-pine	Oak-hickory	Oak-gum-cypress	Elm-ash-cottonwood
		Planted	Natural				
----- <i>Thousand acres</i> -----							
Garland	328.9	70.1	64.7	43.1	151.0	...	...
Logan	242.1	...	60.5	90.8	84.7	6.1	...
Montgomery	413.4	11.8	135.8	106.3	159.5	...	...
Perry	260.8	27.2	92.4	76.1	54.3	10.9	...
Polk	381.6	32.7	43.6	141.7	163.6	...	...
Pulaski	201.8	5.2	25.9	51.7	88.0	25.9	5.2
Saline	349.7	44.4	66.6	94.4	105.5	38.9	...
Scott	442.7	23.0	189.7	92.0	138.0	...	...
Sebastian	149.6	...	6.5	19.5	91.1	19.5	13.0
Yell	401.5	27.9	106.0	117.1	78.1	72.5	...
All counties	3172.2	242.2	791.7	832.8	1113.6	173.7	18.2

Table 4—Area of timberland by county and stand-size class, Ouachita Counties, Arkansas, 1988

County	All classes	Stand-size class			Nonstocked ¹ areas
		Sawtimber	Poletimber	Sapling-seedling	
----- <i>Thousand acres</i> -----					
Garland	328.9	118.6	97.1	113.2	...
Logan	242.1	84.7	72.6	78.7	6.1
Montgomery	413.4	194.9	135.8	82.7	...
Perry	260.8	103.2	81.5	76.1	...
Polk	381.6	109.0	163.6	109.0	...
Pulaski	201.8	82.8	82.8	36.2	...
Saline	349.7	116.6	105.5	122.1	5.6
Scott	442.7	224.2	149.5	69.0	...
Sebastian	149.6	26.0	52.0	71.5	...
Yell	401.5	172.9	139.4	78.1	11.2
All counties	3172.2	1233.0	1079.8	836.7	22.8

¹Timberland less than 16.7 percent stocked.**Table 5—Area of timberland by county and site class, Ouachita Counties, Arkansas, 1988**

County	All classes	Site class (cubic feet/acre/year)				
		> 165	120-165	85-120	50-85	< 50
----- <i>Thousand acres</i> -----						
Garland	328.9	5.4	...	59.3	237.2	27.0
Logan	242.1	...	6.1	6.1	115.0	115.0
Montgomery	413.4	...	17.7	94.5	242.2	59.1
Perry	260.8	...	...	27.2	206.5	27.2
Polk	381.6	...	...	109.0	223.5	49.1
Pulaski	201.8	...	5.2	46.6	113.8	36.2
Saline	349.7	5.6	16.7	99.9	183.2	44.4
Scott	442.7	5.7	11.5	86.2	270.2	69.0
Sebastian	149.6	...	...	6.5	65.0	78.0
Yell	401.5	11.2	16.7	66.9	251.0	55.8
All counties	3172.2	27.8	73.8	602.2	1907.6	560.7

Table 6—Area of timberland by county and stocking classes of growing-stock trees, Ouachita Counties, Arkansas, 1988

County	All classes	Stocking class (percent)				
		> 130	100-130	60-100	16.7-60	< 16.7
----- <i>Thousand acres</i> -----						
Garland	328.9	16.2	75.5	172.5	64.7	...
Logan	242.1	...	30.3	127.1	78.7	6.1
Montgomery	413.4	11.8	124.0	200.8	76.8	...
Perry	260.8	16.3	48.9	168.5	27.2	...
Polk	381.6	10.9	76.3	196.3	98.1	...
Pulaski	201.8	...	15.5	93.1	93.1	...
Saline	349.7	16.7	94.4	172.1	61.1	5.6
Scott	442.7	11.5	132.2	247.2	51.7	...
Sebastian	149.6	...	13.0	65.0	71.5	...
Yell	401.5	5.6	61.3	217.5	106.0	11.2
All counties	3172.2	88.9	671.5	1660.1	728.9	22.8

Table 7—Area of timberland by forest type and ownership class, Ouachita Counties, Arkansas, 1988

Forest type ¹	All ownerships	National forest	Other public	Forest industry	Forest industry-leased	Other private
----- Thousand acres -----						
Loblolly-shortleaf pine	1034.0	579.8	22.0	301.7	...	130.5
Softwood total	1034.0	579.8	22.0	301.7	...	130.5
Oak-pine	832.8	335.7	22.7	220.6	...	253.8
Oak-hickory	1113.6	376.4	69.4	165.4	...	502.4
Oak-gum-cypress	173.7	16.7	46.8	11.1	...	99.0
Elm-ash-cottonwood	18.2	...	13.0	...	...	5.2
Hardwood total	2138.2	728.8	152.0	397.1	...	860.3
All types	3172.2	1308.7	173.9	698.8	...	990.8

¹Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

Table 8—Area of timberland by ownership and stocking classes of growing-stock trees, Ouachita Counties, Arkansas, 1988

Ownership class	All classes	Stocking class (percent)				
		> 130	100-130	60-100	16.7-60	< 16.7
----- <i>Thousand acres</i> -----						
National forest	1308.7	61.6	342.7	682.9	221.4	...
Other public	173.9	...	22.5	67.0	84.5	...
Forest industry	698.8	27.3	160.4	362.4	143.2	5.6
Other private	990.8	...	145.9	547.8	279.9	17.2
All ownerships	3172.2	88.9	671.5	1660.1	728.9	22.8

Table 9—Area of timberland by forest type and stand-size class, Ouachita Counties, Arkansas, 1988

Forest type ¹	Stand-size class				Nonstocked ² areas
	All classes	Sawtimber	Poletimber	Sapling- seedling	
----- <i>Thousand acres</i> -----					
Loblolly-shortleaf pine	1034.0	590.6	206.2	237.1	...
Softwood total	1034.0	590.6	206.2	237.1	...
Oak-pine	832.8	312.6	286.3	233.9	...
Oak-hickory	1113.6	235.0	525.0	342.0	11.6
Oak-gum-cypress	173.7	88.3	57.1	17.1	11.1
Elm-ash-cottonwood	18.2	6.5	5.2	6.5	...
Hardwood total	2138.2	642.4	873.6	599.5	22.8
All types	3172.2	1233.0	1079.8	836.7	22.8

¹Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

²Timberland less than 16.7 percent stocked.

Table 10—Number of live trees on timberland by species and diameter class, Ouachita Counties, Arkansas, 1988

Species	Diameter class (inches at breast height)												
	All classes	1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Thousand trees -----													
Shortleaf-loblolly pine	513678	215709	115400	62457	45872	32925	21467	12088	4879	1775	795	306	4
Cypress	898	498	...	...	48	66	137	42	98	...	8	...	...
Other softwoods	53316	34598	10651	5125	1927	616	196	150	17	25	12	...	...
Total softwoods	567893	250806	126051	67582	47847	33608	21800	12281	4994	1800	815	306	4
Select white oaks	157858	67203	36954	23795	15087	7215	2471	2102	1343	794	508	379	8
Select red oaks	56764	24840	13235	6899	4794	3168	1867	801	522	321	105	201	12
Other white oaks	157724	77620	36244	19980	10700	5907	2805	2501	1018	493	169	283	4
Other red oaks	100568	56093	19952	8999	6039	3531	2081	1430	1068	678	287	348	60
Hickory	241913	147457	56294	22797	8763	3848	1601	642	293	120	59	39	...
Hard maple	5572	3733	1500	278	62	...	...	...	...	...	...	...	...
Soft maple	63914	46312	12222	3257	1399	412	186	39	56	13	9	8	...
Beech	9	...	...	...	...	...	...	...	...	...	9	...	...
Sweetgum	96100	53112	21616	9318	4560	3339	1853	1339	549	229	107	69	7
Tupelo-blackgum	81981	63916	9742	3643	1784	974	616	620	391	100	99	92	4
Ash	30569	22691	3996	1309	1243	635	326	143	165	25	18	18	...
Cottonwood-aspen	20	...	...	...	...	...	...	...	20	...	...	...	...
Basswood	3276	1581	1003	366	68	174	56	21	...	...	...	7	...
Other hardwoods	317318	246907	50728	11341	4154	2351	814	517	194	144	41	122	5
Total hardwoods	1313587	811465	263486	111982	58653	31556	14676	10154	5619	2917	1411	1566	100
Noncommercial	186262	150103	27068	5821	1806	884	411	62	63	27	10	7	...
All species	2067742	1212374	416605	185385	108305	66048	36887	22497	10677	4744	2236	1879	105

Table 11—Number of growing-stock trees on timberland by species and diameter class, Ouachita Counties, Arkansas, 1988

Species	All classes	Diameter class (inches at breast height)											
		1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
----- Thousand trees -----													
Shortleaf-loblolly pine	403233	145710	86337	54039	43641	32469	21324	12026	4849	1762	774	297	4
Cypress	400	...	...	...	48	66	137	42	98	...	8	...	...
Other softwoods	42651	26031	9628	4398	1870	376	144	150	17	25	12	...	...
Total softwoods	446284	171741	95966	58438	45559	32911	21605	12218	4963	1787	794	297	4
Select white oaks	101818	28073	27629	19600	14026	6656	2235	1560	989	536	301	204	8
Select red oaks	32603	6773	11172	5500	4017	2587	1286	506	336	209	77	134	8
Other white oaks	69856	21411	16222	14430	8541	4531	1828	1646	628	363	89	169	...
Other red oaks	67150	31121	15353	7468	5566	3055	1680	1140	819	475	228	212	35
Hickory	88927	31052	28715	16663	7259	3089	1172	542	248	108	39	39	...
Hard maple	839	...	500	278	62	...	...	...	...	...	...	...	...
Soft maple	15388	8630	3991	1557	958	154	24	39	27	...	9	...	...
Sweetgum	54005	19647	16068	7449	3723	3271	1748	1232	504	229	86	44	4
Tupelo-blackgum	25555	16187	3545	2767	1224	690	356	362	241	76	71	32	4
Ash	10020	4805	2011	1081	994	546	326	85	119	25	18	8	...
Cottonwood-aspen	20	...	...	...	...	...	...	...	20	...	...	...	...
Basswood	1620	...	1003	366	...	174	56	21	...	...	...	...	...
Other hardwoods	79115	45592	21140	6558	2876	1765	590	257	118	109	31	74	2
Total hardwoods	546914	213290	147348	83715	49247	26518	11301	7390	4048	2130	949	917	61
All species	993199	385031	243314	142153	94806	59429	32906	19608	9011	3917	1743	1214	65

Table 12—Volume of growing stock on timberland by species and diameter class, Ouachita Counties, Arkansas, 1988

Species	All classes	Diameter class (inches at breast height)									
		5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
----- Million cubic feet -----											
Shortleaf-loblolly pine	2017.9	140.4	303.0	430.3	433.2	349.7	193.4	92.9	49.2	25.5	0.5
Cypress	6.2	...	0.2	0.8	1.6	0.9	2.5	...	0.2	...	...
Other softwoods	26.4	10.0	8.1	3.0	1.8	2.1	0.4	0.7	0.5	...	...
Total softwoods	2050.5	150.3	311.3	434.0	436.6	352.6	196.2	93.6	49.9	25.5	0.5
Select white oaks	332.4	51.0	77.9	65.7	34.7	32.6	29.1	18.4	12.8	9.9	0.2
Select red oaks	124.9	15.9	23.4	24.8	19.8	11.0	8.7	8.2	3.5	8.8	0.9
Other white oaks	203.8	31.9	41.8	39.5	23.5	30.0	14.0	10.8	3.8	8.5	...
Other red oaks	193.6	17.8	29.9	28.5	26.3	24.7	23.3	16.8	10.2	12.7	3.3
Hickory	133.1	32.1	32.3	26.3	16.4	10.9	6.9	3.8	1.9	2.4	...
Hard maple	1.4	0.9	0.5	...	...	...	...	...	...	...	...
Soft maple	12.1	3.7	4.6	1.3	0.4	0.9	0.8	...	0.5	...	...
Sweetgum	170.5	15.5	21.6	36.9	31.2	30.2	16.0	10.5	5.2	3.0	0.4
Tupelo-blackgum	44.1	5.7	5.8	5.7	5.5	7.1	6.6	2.4	3.1	1.6	0.6
Ash	26.5	2.8	5.8	5.4	4.9	1.9	3.5	0.9	0.9	0.4	...
Cottonwood-aspen	0.5	...	...	...	...	...	0.5	...	...	...	...
Basswood	3.4	0.8	...	1.3	0.8	0.5	...	...	...	...	...
Other hardwoods	72.8	14.9	13.9	16.7	8.8	4.8	2.9	4.2	1.5	5.0	0.2
Total hardwoods	1319.0	192.9	257.7	252.1	172.2	154.6	112.2	76.1	43.5	52.3	5.6
All species	3369.6	343.2	568.9	686.1	608.8	507.2	308.4	169.6	93.4	77.8	6.0

Table 13—Volume of growing stock in the saw-log portion of sawtimber¹ trees on timberland by species and diameter class, Ouachita Counties, Arkansas, 1988

Species	All classes	Diameter class (inches at breast height)							
		9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million cubic feet -----									
Shortleaf-loblolly pine	1376.9	362.5	382.6	312.7	171.1	83.0	42.7	22.0	0.4
Cypress	5.1	0.6	1.3	0.8	2.2	...	0.2	...	...
Other softwoods	7.4	2.3	1.7	1.9	0.4	0.7	0.5	...	...
Total softwoods	1389.4	365.5	385.6	315.4	173.6	83.7	43.4	22.0	0.4
Select white oaks	112.7	...	27.1	27.1	24.4	15.0	10.7	8.3	0.2
Select red oaks	50.8	...	15.4	9.3	7.7	6.9	3.2	7.6	0.8
Other white oaks	76.8	...	18.8	25.7	12.4	9.0	3.2	7.6	...
Other red oaks	99.1	...	19.9	20.9	20.3	14.7	8.7	11.6	2.9
Hickory	35.9	...	13.4	9.2	6.0	3.2	1.8	2.2	...
Soft maple	1.9	...	0.3	0.7	0.6	...	0.3	...	...
Sweetgum	77.8	...	21.3	25.3	13.7	9.5	4.9	2.8	0.3
Tupelo-blackgum	22.8	...	4.3	6.0	6.0	2.1	2.9	1.0	0.5
Ash	10.3	...	3.8	1.7	3.0	0.7	0.8	0.3	...
Cottonwood-aspen	0.4	...	...	...	0.4	...	...	...	...
Basswood	1.2	...	0.7	0.5	...	...	...	...	...
Other hardwoods	22.8	...	6.7	3.9	2.6	3.7	1.3	4.4	0.2
Total hardwoods	512.4	...	131.6	130.3	97.1	64.9	37.7	45.8	4.9
All species	1901.9	365.5	517.1	445.7	270.7	148.6	81.1	67.7	5.3

¹That part of the bole of sawtimber trees between a 1-foot stump and saw-log top, including the portion of the forks large enough to contain a saw log.

Table 14—Volume of sawtimber on timberland by species and diameter class, Ouachita Counties, Arkansas, 1988

Species	All classes	Diameter class (inches at breast height)							
		9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million board feet -----									
Shortleaf-loblolly pine	8428.4	2034.4	2298.5	1973.8	1114.4	560.2	290.0	154.4	2.7
Cypress	22.7	2.9	5.9	3.5	10.1	...	0.3	...	...
Other softwoods	37.1	11.2	8.3	9.2	1.8	3.8	2.9	...	...
Total softwoods	8488.2	2048.4	2312.7	1986.5	1126.3	564.0	293.2	154.4	2.7
Select white oaks	675.1	...	150.3	159.4	148.2	93.6	70.0	53.3	0.2
Select red oaks	302.8	...	87.4	54.5	45.7	42.5	20.8	47.6	4.3
Other white oaks	447.0	...	100.9	147.4	72.8	54.9	20.4	50.5	...
Other red oaks	573.5	...	107.8	118.8	119.1	88.3	54.0	70.2	15.3
Hickory	210.9	...	73.3	54.4	38.1	21.1	10.9	13.0	...
Soft maple	11.0	...	1.5	4.2	3.4	...	2.0	...	...
Sweetgum	449.1	...	117.1	144.9	80.3	58.1	29.2	17.7	2.0
Tupelo-blackgum	132.4	...	24.4	33.7	34.6	12.8	17.1	6.2	3.5
Ash	58.6	...	21.0	9.9	17.3	4.0	4.5	2.0	...
Cottonwood-aspen	2.2	...	...	...	2.2	...	...	...	...
Basswood	6.7	...	3.7	3.1	...	...	...	...	...
Other hardwoods	129.2	...	37.9	21.0	14.9	21.0	7.5	26.4	0.5
Total hardwoods	2998.6	...	725.4	751.3	576.6	396.3	236.3	287.0	25.8
All species	11486.8	2048.4	3038.1	2737.8	1702.9	960.2	529.5	441.3	28.5

Table 15—Volume of growing stock and sawtimber on timberland by county and species group, Ouachita Counties, Arkansas, 1988

County	Growing stock						Sawtimber							
	All species	Softwood			Hardwood		All species	Softwood			Hardwood			
		Pine	Planted	Natural	Other	Soft ¹		Hard ²	Pine	Planted	Natural	Other	Soft ¹	Hard ²
----- Million cubic feet -----						----- Million board feet -----								
Garland	288.5	9.8	159.9	0.5	20.7	97.6	872.3	7.0	663.4	0.8	29.7	171.5		
Logan	208.1	...	115.8	5.3	16.2	70.9	705.0	...	445.4	7.3	46.6	205.7		
Montgomery	625.8	35.3	398.5	0.3	26.2	165.5	2432.1	102.7	1903.8	...	50.8	374.8		
Perry	238.9	3.6	160.2	1.1	15.6	58.4	848.9	...	671.1	0.8	60.1	116.8		
Polk	359.7	4.1	178.7	2.9	30.7	143.3	1062.3	17.7	734.9	1.5	71.4	236.8		
Pulaski	177.6	1.6	65.3	6.8	27.0	76.8	556.9	3.3	276.9	24.7	67.2	184.8		
Saline	336.9	25.9	134.3	0.3	50.7	125.7	1111.8	79.9	553.3	...	136.2	342.4		
Scott	629.9	36.1	420.7	7.6	30.1	135.4	2138.4	126.5	1675.3	12.5	81.2	242.8		
Sebastian	51.4	...	6.7	2.2	10.9	31.7	117.1	...	16.1	7.1	12.9	81.0		
Yell	452.8	6.0	255.7	5.5	65.2	120.5	1642.0	23.0	1128.1	5.0	169.1	316.8		
All counties	3369.6	122.3	1895.7	32.6	293.2	1025.8	11486.8	360.1	8068.4	59.8	725.2	2273.5		

¹Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

²Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 16—Volume of timber on timberland by class of timber and species group, Ouachita Counties, Arkansas, 1988

Class of timber	All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²
		Planted	Natural			
----- Million cubic feet -----						
Sawtimber trees:						
Saw-log portion	1901.9	58.7	1318.3	12.5	125.7	386.7
Upper-stem portion	303.5	10.1	187.5	1.9	28.0	76.0
Total	2205.4	68.8	1505.8	14.4	153.7	462.7
Poletimber trees	1164.2	53.5	389.9	18.2	139.5	563.1
All growing-stock trees	3369.6	122.3	1895.7	32.6	293.2	1025.8
Rough trees:						
Sawtimber size	109.4	0.2	6.6	1.7	13.8	87.0
Poletimber size	150.3	8.2	23.9	1.2	24.8	92.3
Total	259.7	8.4	30.5	2.9	38.6	179.4
Rotten trees:						
Sawtimber size	39.6	...	0.2	0.1	10.9	28.3
Poletimber size	4.3	...	...	...	2.0	2.3
Total	43.9	...	0.2	0.1	12.9	30.6
Salvable dead trees:						
Sawtimber size	12.9	0.6	6.3	0.2	...	5.7
Poletimber size	9.9	1.1	4.2	0.7	1.1	2.8
Total	22.8	1.7	10.5	1.0	1.1	8.5
All classes	3696.0	132.4	1936.9	36.6	345.9	1244.2

¹Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

²Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 17—Volume of live trees and growing stock on timberland by ownership class and species group, Ouachita Counties, Arkansas, 1988

Ownership class	Live trees						Growing stock					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine		Other	Soft ¹	Hard ²		Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
	----- Million cubic feet -----											
National forest	2048.3	71.5	1318.4	9.0	107.5	541.9	1888.5	65.8	1295.1	8.6	86.0	432.9
Other public	175.7	1.6	35.6	2.4	47.9	88.2	157.6	1.6	35.2	2.4	41.9	76.5
Forest industry	503.2	28.1	292.5	2.2	31.1	149.2	471.4	26.4	289.3	1.7	25.4	128.6
Other private	946.0	29.4	279.8	22.1	158.2	456.4	852.0	28.4	276.0	19.9	139.8	387.8
All ownerships	3673.2	130.7	1926.3	35.7	344.7	1235.8	3369.6	122.3	1895.7	32.6	293.2	1025.8

¹Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.
²Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 18—Average net annual growth of growing stock and sawtimber on timberland by county and species group, Ouachita Counties, Arkansas, 1988

County	Growing stock						Sawtimber						
	Softwood				Hardwood		Softwood				Hardwood		
	All species	Pine			Other	Soft ¹	Hard ²	All species	Pine			Soft ¹	Hard ²
		Planted	Natural	Other					Planted	Natural	Other		
----- Million cubic feet -----						----- Million board feet -----							
Garland	9.6	...	5.1	...	0.5	4.1	33.5	0.4	24.7	0.1	0.6	7.7	
Logan	5.7	...	3.8	0.3	0.5	1.0	28.3	...	20.2	0.7	2.8	4.5	
Montgomery	17.8	0.1	10.7	...	1.1	5.8	97.9	0.6	75.6	...	3.6	18.2	
Perry	8.2	0.2	4.8	0.1	0.8	2.3	39.8	2.0	28.5	0.1	3.2	5.9	
Polk	12.6	0.1	5.7	0.1	1.3	5.5	45.8	1.0	28.3	0.1	3.9	12.6	
Pulaski	8.3	...	3.0	...	1.8	3.5	32.7	...	16.0	...	5.4	11.4	
Saline	13.5	0.6	5.5	...	1.2	6.2	56.1	2.2	30.1	...	4.1	19.6	
Scott	19.2	0.2	14.2	0.6	1.1	3.1	81.9	1.2	70.5	1.1	3.4	5.8	
Sebastian	0.4	...	0.3	0.1	-0.1	0.2	5.0	...	1.8	0.3	0.3	2.7	
Yell	13.3	...	8.0	0.2	1.9	3.4	67.8	...	47.7	0.3	5.2	14.6	
All counties	108.6	1.2	61.0	1.5	10.0	34.9	488.9	7.5	343.4	2.6	32.5	102.9	

¹Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.
²Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 19—Average net annual removals of growing stock and sawtimber on timberland by county and species group, Ouachita Counties, Arkansas, 1988

County	Growing stock						Sawtimber					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine	Other		Soft ¹	Hard ²		Pine	Other		Soft ¹	Hard ²
----- Million cubic feet -----						----- Million board feet -----						
Garland	16.0	...	11.7	...	0.3	4.0	62.2	...	54.2	...	0.9	7.1
Logan	5.9	...	5.2	...	0.1	0.6	26.0	...	24.7	...	...	1.4
Montgomery	18.8	1.5	13.0	...	0.7	3.6	69.6	8.0	56.6	...	0.7	4.3
Perry	8.9	0.9	5.8	...	0.4	1.8	34.8	4.4	27.4	...	1.2	1.9
Polk	16.8	0.1	14.9	...	0.2	1.5	72.1	0.5	68.3	...	0.2	3.2
Pulaski	3.4	...	2.0	...	0.4	1.0	9.2	...	7.0	...	0.9	1.3
Saline	21.7	2.4	12.3	...	1.3	5.6	70.9	9.2	44.8	...	3.4	13.6
Scott	17.4	...	15.6	0.2	...	1.6	66.1	...	63.9	0.6	...	1.5
Sebastian	1.2	...	1.0	...	...	0.1	4.1	...	4.1	...	...	...
Yell	10.9	...	8.3	0.3	0.5	1.8	37.9	0.1	28.0	0.9	2.0	6.8
All counties	121.0	4.9	89.8	0.6	4.0	21.6	453.0	22.2	378.9	1.6	9.3	41.0

¹Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

²Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 20—Average net annual growth and average annual removals of growing stock on timberland by species, Ouachita Counties, Arkansas, 1988

Species	Growth	Removals
----- Million cubic feet -----		
Yellow pines	62.3	94.7
Other softwoods	1.5	0.6
Total softwoods	63.7	95.3
Select white-red oaks	16.9	8.4
Other white-red oaks	12.9	10.8
Hickory	4.0	2.0
Hard maple	...	...
Sweetgum	5.6	2.1
Ash-walnut-black cherry	1.0	0.3
Other hardwoods	4.4	2.1
Total hardwoods	44.9	25.6
All species	108.6	121.0

Table 21—Average net annual growth and average annual removals of sawtimber on timberland by species, Ouachita Counties, Arkansas, 1988

Species	Growth	Removals
---- Million board feet ----		
Yellow pines	350.9	401.1
Other softwoods	2.6	1.6
Total softwoods	353.5	402.7
Select white-red oaks	49.8	15.8
Other white-red oaks	43.3	23.1
Hickory	7.5	2.0
Sweetgum	19.1	5.0
Ash-walnut-black cherry	3.8	0.5
Other hardwoods	11.9	3.9
Total hardwoods	135.4	50.3
All species	488.9	453.0

Table 22—Average annual mortality of growing stock and sawtimber on timberland by species, Ouachita Counties, Arkansas, 1988

Species	Growing stock	Sawtimber
---- Million cubic feet ---- Million board feet ----		
Yellow pines	9.4	23.9
Other softwoods	0.2	0.3
Total softwoods	9.6	24.2
Select white-red oaks	3.5	4.4
Other white-red oaks	4.4	11.4
Hickory	1.2	2.7
Sweetgum	1.7	4.7
Ash-walnut-black cherry	0.2	0.7
Other hardwoods	1.6	1.8
Total hardwoods	12.6	25.7
All species	22.1	49.9

Table 23—Average net annual growth and average annual removals of growing stock on timberland by ownership class and species group, Ouachita Counties, Arkansas, 1988

Ownership class	Growth						Removals					
	Softwood				Hardwood		Softwood				Hardwood	
	All species	Pine		Other	Soft ¹	Hard ²	All species	Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
----- Million cubic feet -----												
National forest	49.5	0.4	32.1	0.3	3.2	13.4	38.7	0.1	33.0	...	0.4	5.1
Other public	4.9	...	1.4	...	1.3	2.2	1.5	...	0.9	...	0.2	0.3
Forest industry	21.0	0.3	14.1	0.1	0.9	5.6	50.6	3.0	37.9	0.1	1.6	8.0
Other private	33.3	0.5	13.5	1.0	4.6	13.7	30.3	1.8	17.9	0.5	1.9	8.2
All ownerships	108.6	1.2	61.0	1.5	10.0	34.9	121.0	4.9	89.8	0.6	4.0	21.6

¹Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

²Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 24—Average net annual growth and average annual removals of sawtimber on timberland by ownership class and species group, Ouachita Counties, Arkansas, 1988

Ownership class	Growth						Removals					
	Softwood				Hardwood		Softwood				Hardwood	
	All species	Pine		Other	Soft ¹	Hard ²	All species	Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
----- Million board feet -----												
National forest	251.4	2.9	204.1	0.4	11.5	32.4	143.8	...	140.1	...	0.2	3.5
Other public	21.0	...	5.4	0.4	4.8	10.5	5.5	...	4.3	...	0.9	0.3
Forest industry	89.6	1.9	71.4	0.1	2.5	13.7	201.2	13.7	169.7	...	3.8	14.1
Other private	126.9	2.6	62.4	1.8	13.8	46.3	102.5	8.5	64.8	1.6	4.4	23.2
All ownerships	488.9	7.5	343.4	2.6	32.5	102.9	453.0	22.2	378.9	1.6	9.3	41.0

¹Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.
²Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 25—Volume of sawtimber on timberland by species and tree grade, Ouachita Counties, Arkansas, 1988

Species	All grades	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
----- Million board feet -----						
Yellow pines	8428.4	2678.8	2686.2	3032.1	...	31.4
Cypress	22.7	22.4	...	...	...	0.3
Redcedar	37.1	37.1	...	...	...	...
Total softwoods	8488.2	2738.2	2686.2	3032.1	...	31.8
Select white-red oaks	977.8	31.1	150.1	461.5	293.7	41.5
Other white-red oaks	1020.5	27.2	123.3	429.4	385.2	55.5
Hickory	210.9	4.3	13.1	111.7	58.6	23.2
Sweetgum	449.1	45.5	81.9	215.9	84.4	21.5
Tupelo and blackgum	132.4	7.9	21.6	63.5	22.9	16.6
Ash-walnut-black cherry	82.5	4.1	8.8	59.7	1.9	8.1
Other hardwoods	125.3	7.6	17.0	58.4	21.4	20.9
Total hardwoods	2998.6	127.7	415.6	1400.2	867.9	187.2
All species	11486.8	2865.9	3101.8	4432.3	867.9	218.9

Supplemental Tables 26-36

Table 26—Area of timberland by stand age, forest type group and type of regeneration, Ouachita Counties, Arkansas, 1988

Stand age class	Pine		Oak-pine		Other hardwood types	
	Artificial	Natural	Artificial	Natural	Artificial	Natural
----- Thousand acres -----						
1-10	109.8	22.0	78.7	22.1	61.9	56.3
11-20	92.9	5.6	...	5.6	5.4	...
21-30	...	11.3	...	5.2	...	...
31-40	5.9	...	...	...	...	5.6
41-50	5.7	5.4	...	...	...	...
> 50	5.7	49.6	...	21.7	...	...
Mixed	22.2	697.8	34.9	664.6	28.3	1147.9
Total	242.2	791.7	113.6	719.2	95.6	1209.8

Table 27—Volume of softwood growing stock on timberland by forest type, Ouachita Counties, Arkansas, 1988

County	Total	Forest type group				
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress
		Planted	Natural			
----- <i>Million cubic feet</i> -----						
Garland	170.1	8.0	108.6	21.4	32.2	...
Logan	121.1	...	79.7	34.5	6.9	...
Montgomery	434.0	25.4	318.3	64.0	26.4	...
Perry	164.9	3.2	115.7	41.3	4.0	0.7
Polk	185.7	1.3	73.6	88.4	22.4	...
Pulaski	73.7	1.6	24.9	32.9	8.1	6.2
Saline	160.5	25.5	71.7	50.9	11.2	1.1
Scott	464.4	36.1	345.1	56.2	27.1	...
Sebastian	8.9	...	3.7	2.1	3.1	...
Yell	267.2	2.3	175.1	80.2	6.3	3.4
All counties	2050.5	103.4	1316.4	471.7	147.7	11.4

Table 28—Volume of hardwood growing stock on timberland by forest type, Ouachita Counties, Arkansas, 1988

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak-pine	Oak-hickory	Oak-gum-cypress	Elm-ash-cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Garland	118.4	0.6	23.0	9.7	85.1	...	...
Logan	87.1	...	9.4	21.6	40.6	15.4	...
Montgomery	191.7	1.2	41.8	56.0	92.6	...	...
Perry	74.0	0.2	13.4	17.2	26.1	17.2	...
Polk	173.9	0.7	15.3	65.2	92.7	...	...
Pulaski	103.8	0.9	2.6	25.3	54.8	18.3	1.8
Saline	176.5	3.9	12.0	51.5	72.8	36.3	...
Scott	165.5	2.0	26.4	40.2	96.9	...	...
Sebastian	42.5	...	...	2.8	23.0	14.3	2.4
Yell	185.6	...	18.4	42.0	35.3	90.0	...
All counties	1319.0	9.6	162.1	331.7	619.9	191.5	4.3

Table 29—Volume of softwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, Ouachita Counties, Arkansas, 1988

County	Total	Forest type group				
		Loblolly-shortleaf pine		Oak-pine	Oak-hickory	Oak-gum-cypress
		Planted	Natural			
----- Million cubic feet -----						
Garland	110.2	0.9	70.6	14.4	24.3	...
Logan	77.6	...	53.8	20.1	3.7	...
Montgomery	311.9	11.0	236.1	46.2	18.6	...
Perry	114.4	...	83.0	28.3	2.6	0.5
Polk	122.2	...	53.4	55.5	13.3	...
Pulaski	51.8	0.6	18.0	23.0	5.1	5.1
Saline	107.3	13.4	47.7	36.7	8.7	0.8
Scott	300.7	20.2	228.3	34.6	17.6	...
Sebastian	4.4	...	1.7	...	2.7	...
Yell	189.0	...	124.8	58.4	4.1	1.8
All counties	1389.4	46.2	917.5	317.1	100.5	8.2

Table 30—Volume of hardwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, Ouachita Counties, Arkansas, 1988

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress	Elm-ash- cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Garland	35.5	...	3.0	2.9	29.5	...	...
Logan	43.6	...	4.3	8.7	19.9	10.7	...
Montgomery	71.1	...	15.2	24.7	31.2	...	...
Perry	30.1	...	3.6	6.0	8.3	12.2	...
Polk	52.2	0.3	4.2	17.5	30.1	...	...
Pulaski	43.4	0.2	1.6	8.5	24.5	8.3	0.3
Saline	83.6	0.9	5.6	21.3	35.6	20.1	...
Scott	54.8	0.9	6.1	12.8	35.0	...	...
Sebastian	15.9	...	...	1.3	8.7	4.5	1.3
Yell	82.2	...	4.7	12.6	14.8	50.1	...
All counties	512.4	2.3	48.4	116.5	237.8	105.9	1.6

Table 31—Volume of timber on timberland by county, class of timber and species group, Ouachita Counties, Arkansas, 1988

County	All classes	Growing stock		Rough		Rotten	
		Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
----- Million cubic feet -----							
Garland	306.4	170.1	118.4	0.6	13.7	...	3.5
Logan	234.4	121.1	87.1	3.0	22.0	...	1.3
Montgomery	675.7	434.0	191.7	13.1	32.0	0.1	4.7
Perry	254.6	164.9	74.0	4.3	8.9	...	2.4
Polk	403.8	185.7	173.9	4.4	28.8	...	10.9
Pulaski	190.2	73.7	103.8	0.3	10.6	...	1.8
Saline	355.0	160.5	176.5	1.0	13.1	...	3.9
Scott	692.2	464.4	165.5	10.7	42.2	0.2	9.3
Sebastian	71.5	8.9	42.5	0.7	17.5	...	1.9
Yell	489.4	267.2	185.6	3.6	29.1	...	3.9
All counties	3673.2	2050.5	1319.0	41.8	218.0	0.4	43.5

Table 32—Number of live trees on timberland by detailed species and diameter class, Ouachita Counties, Arkansas, 1988

Species	Diameter class (inches at breast height)												
	All classes	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
----- Thousand trees -----													
Shortleaf pine	423223	175152	85270	50476	41634	31253	20628	11567	4651	1633	690	270	...
Loblolly pine	90455	40557	30130	11981	4237	1672	839	521	229	142	105	37	4
Redcedar	53316	34598	10651	5125	1927	616	196	150	17	25	12	...	...
Cypress	898	498	...	...	48	66	137	42	98	...	8	...	...
Total softwoods	567893	250806	126051	67582	47847	33608	21800	12281	4994	1800	815	306	4
Select white oaks	157858	67203	36954	23795	15087	7215	2471	2102	1343	794	508	379	8
Select red oaks	56764	24840	13235	6899	4794	3168	1867	801	522	321	105	201	12
Other white oaks	157724	77620	36244	19980	10700	5907	2805	2501	1018	493	169	283	4
Other red oaks	100568	56093	19952	8999	6039	3531	2081	1430	1068	678	287	348	60
Sweet pecan	28	...	...	...	...	...	...	...	...	...	28	...	...
Water hickory	8	...	...	...	...	...	...	...	...	...	...	8	...
Other hickories	241877	147457	56294	22797	8763	3848	1601	642	293	120	30	31	...
Persimmon	13646	13035	494	...	74	42	...	...	...	...	...	...	...
Hard maple	5572	3733	1500	278	62	...	...	...	...	...	...	...	...
Soft maple	63053	45837	12222	3163	1278	315	162	39	15	13	...	8	...
Boxelder	860	474	...	93	121	98	24	...	41	...	9	...	...
Beech	9	...	...	...	...	...	...	...	...	...	9	...	...
Sweetgum	96100	53112	21616	9318	4560	3339	1853	1339	549	229	107	69	7
Blackgum	81926	63916	9742	3643	1729	974	616	620	391	100	99	92	4
Other gums/tupelos	55	...	...	...	55	...	...	...	...	...	...	...	...
White ash	20157	16321	2973	337	239	105	79	61	32	...	9	...	...
Other ashes	10412	6370	1023	972	1004	529	247	82	134	25	9	18	...
Sycamore	819	...	511	...	59	75	25	20	48	24	10	41	5
Cottonwood	20	...	...	...	...	...	...	...	20	...	...	...	...
Basswood	3276	1581	1003	366	68	174	56	21	...	...	...	7	...
Willow	195	...	...	...	63	106	26	...	...	...	...	...	...
Black cherry	15675	9815	3643	890	708	310	165	75	31	38	...	...	...
American elm	18150	12426	3302	1129	431	432	174	132	42	22	20	39	...
Other elms	169574	131599	27309	6941	2295	1054	197	153	28	...	...	...	...
River birch	628	...	...	329	52	49	90	60	17	13	...	19	...
Hackberry	5851	3053	1050	1146	291	122	59	36	14	47	10	22	...
Black locust	702	542	...	160	...	...	...	...	...	...	...	...	...
Other locusts	393	...	...	189	68	69	52	...	14	...	...	...	...
Sassafras	6222	5403	596	132	45	46	...	...	...	...	...	...	...
Dogwood	78293	65396	12753	144	...	...	...	...	...	...	...	...	...
Holly	2020	1997	...	...	...	...	...	23	...	...	...	...	...
Other commercial	5150	3642	1069	282	68	45	26	19	...	...	...	...	...
Total hardwoods	1313587	811465	263486	111982	58653	31556	14676	10154	5619	2917	1411	1566	100
Noncommercial	186262	150103	27068	5821	1806	884	411	62	63	27	10	7	...
All species	2067742	1212374	416605	185385	108305	66048	36887	22497	10677	4744	2236	1879	105

Table 33—Number of growing-stock trees on timberland by detailed species and diameter class, Ouachita Counties, Arkansas, 1988

Species	Diameter class (inches at breast height)										
	All classes	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
----- Thousand trees -----											
Shortleaf pine	153350	43715	39536	30921	20484	11524	4620	1621	669	260	...
Loblolly pine	17836	10325	4105	1548	839	502	229	142	105	37	4
Redcedar	6992	4398	1870	376	144	150	17	25	12	...	...
Cypress	400	...	48	66	137	42	98	...	8	...	...
Total softwoods	178577	58438	45559	32911	21605	12218	4963	1787	794	297	4
Select white oaks	46116	19600	14026	6656	2235	1560	989	536	301	204	8
Select red oaks	14659	5500	4017	2587	1286	506	336	209	77	134	8
Other white oaks	32223	14430	8541	4531	1828	1646	628	363	89	169	...
Other red oaks	20676	7468	5566	3055	1680	1140	819	475	228	212	35
Sweet pecan	9	...	...	...	...	...	...	...	9	...	...
Water hickory	8	...	...	...	...	...	...	...	...	8	...
Other hickories	29142	16663	7259	3089	1172	542	248	108	30	31	...
Persimmon	117	...	74	42	...	...	...	...	...	...	...
Hard maple	339	278	62	...	...	...	...	...	...	...	...
Soft maple	2552	1464	895	154	...	39	...	...	...	...	...
Boxelder	215	93	63	...	24	...	27	...	9	...	...
Sweetgum	18291	7449	3723	3271	1748	1232	504	229	86	44	4
Blackgum	5768	2767	1168	690	356	362	241	76	71	32	4
Other gums/tupelos	55	...	55	...	...	...	...	...	...	...	...
White ash	700	337	181	70	79	23	...	...	9	...	...
Other ashes	2504	743	813	477	247	62	119	25	9	8	...
Sycamore	257	...	59	75	25	20	...	24	10	41	2
Cottonwood	20	...	...	...	...	...	20	...	...	...	...
Basswood	617	366	...	174	56	21	...	...	...	...	...
Willow	165	...	63	75	26	...	...	...	...	...	...
Black cherry	1318	464	449	196	116	36	31	25	...	...	...
American elm	1650	964	166	344	80	42	29	...	10	14	...
Other elms	7493	4597	1822	837	169	41	28	...	...	...	...
River birch	457	206	52	...	90	60	17	13	...	19	...
Hackberry	736	327	190	81	31	36	14	47	10	...	...
Other locusts	121	...	...	69	52	...	...	...	...	...	...
Holly	23	...	...	...	...	23	...	...	...	...	...
Other commercial	45	...	...	45	...	...	...	...	...	...	...
Total hardwoods	186276	83715	49247	26518	11301	7390	4048	2130	949	917	61
All species	364853	142153	94806	59429	32906	19608	9011	3917	1743	1214	65

Table 34—Volume of growing-stock trees on timberland by species and diameter class, Ouachita Counties, Arkansas, 1988

Species	Diameter class (inches at breast height)										
	All classes	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
<i>----- Million cubic feet -----</i>											
Shortleaf pine	1909.7	123.0	283.1	412.5	418.1	336.4	185.3	86.0	42.8	22.6	...
Loblolly pine	108.2	17.4	19.9	17.7	15.1	13.2	8.1	6.9	6.5	2.9	0.5
Redcedar	26.4	10.0	8.1	3.0	1.8	2.1	0.4	0.7	0.5	...	...
Cypress	6.2	...	0.2	0.8	1.6	0.9	2.5	...	0.2	...	...
Total softwoods	2050.5	150.3	311.3	434.0	436.6	352.6	196.2	93.6	49.9	25.5	0.5
Select white oaks	332.4	51.0	77.9	65.7	34.7	32.6	29.1	18.4	12.8	9.9	0.2
Select red oaks	124.9	15.9	23.4	24.8	19.8	11.0	8.7	8.2	3.5	8.8	0.9
Other white oaks	203.8	31.9	41.8	39.5	23.5	30.0	14.0	10.8	3.8	8.5	...
Other red oaks	193.6	17.8	29.9	28.5	26.3	24.7	23.3	16.8	10.2	12.7	3.3
Sweet pecan	0.4	...	...	...	...	...	...	...	0.4	...	...
Water hickory	0.5	...	...	...	...	...	...	...	...	0.5	...
Other hickories	132.2	32.1	32.3	26.3	16.4	10.9	6.9	3.8	1.6	1.8	...
Persimmon	0.7	...	0.3	0.4	...	...	...	...	...	...	...
Hard maple	1.4	0.9	0.5	...	...	...	...	...	...	...	...
Soft maple	10.1	3.5	4.4	1.3	...	0.9	...	...	...	...	...
Boxelder	2.0	0.2	0.2	...	0.4	...	0.8	...	0.5	...	...
Sweetgum	170.5	15.5	21.6	36.9	31.2	30.2	16.0	10.5	5.2	3.0	0.4
Blackgum	43.8	5.7	5.6	5.7	5.5	7.1	6.6	2.4	3.1	1.6	0.6
White ash	4.4	0.8	0.8	0.6	1.2	0.4	...	...	0.5	...	...
Other ashes	22.1	2.0	5.0	4.8	3.7	1.5	3.5	0.9	0.4	0.4	...
Sycamore	6.8	...	0.5	0.6	0.6	0.6	...	0.9	0.6	2.8	0.2
Cottonwood	0.5	...	...	...	...	...	0.5	...	...	...	...
Basswood	3.4	0.8	...	1.3	0.8	0.5	...	...	...	...	...
Willow	1.2	...	0.2	0.6	0.4	...	...	...	...	...	...
Black cherry	10.9	1.3	2.5	2.5	2.3	0.7	0.7	0.9	...	...	...
American elm	10.8	2.6	0.7	3.0	1.1	0.9	0.8	...	0.5	1.2	...
Other elms	29.7	9.6	8.5	8.2	2.0	0.7	0.8	...	...	...	...
River birch	5.6	0.6	0.5	...	1.6	1.0	0.3	0.6	...	1.0	...
Hackberry	5.2	0.7	0.7	0.5	0.2	0.6	0.3	1.7	0.5	...	...
Other locusts	1.1	...	...	0.4	0.6	...	...	...	...	...	...
Holly	0.3	...	...	...	...	0.3	...	...	...	...	...
Other commercial	0.4	...	...	0.4	...	...	...	...	...	...	...
Total hardwoods	1319.0	192.9	257.7	252.1	172.2	154.6	112.2	76.1	43.5	52.3	5.6
All species	3369.6	343.2	568.9	686.1	608.8	507.2	308.4	169.6	93.4	77.8	6.0

Table 35—Volume of growing stock in the saw-log portion of sawtimber trees on timberland by detailed species and diameter class, Ouachita Counties, Arkansas, 1988

Species	All classes	Diameter class (inches at breast height)							
		9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Million cubic feet -----									
Shortleaf pine	1317.8	348.2	370.0	301.5	164.2	77.2	37.2	19.4	...
Loblolly pine	59.1	14.3	12.6	11.2	6.8	5.7	5.5	2.6	0.4
Redcedar	7.4	2.3	1.7	1.9	0.4	0.7	0.5	...	...
Cypress	5.1	0.6	1.3	0.8	2.2	...	0.2	...	...
Total softwoods	1389.4	365.5	385.6	315.4	173.6	83.7	43.4	22.0	0.4
Select white oaks	112.7	...	27.1	27.1	24.4	15.0	10.7	8.3	0.2
Select red oaks	50.8	...	15.4	9.3	7.7	6.9	3.2	7.6	0.8
Other white oaks	76.8	...	18.8	25.7	12.4	9.0	3.2	7.6	...
Other red oaks	99.1	...	19.9	20.9	20.3	14.7	8.7	11.6	2.9
Sweet pecan	0.4	...	...	...	...	...	0.4	...	...
Water hickory	0.5	...	...	...	...	...	...	0.5	...
Other hickories	35.0	...	13.4	9.2	6.0	3.2	1.5	1.7	...
Soft maple	0.7	...	...	0.7	...	...	...	...	...
Boxelder	1.1	...	0.3	...	0.6	...	0.3	...	...
Sweetgum	77.8	...	21.3	25.3	13.7	9.5	4.9	2.8	0.3
Blackgum	22.8	...	4.3	6.0	6.0	2.1	2.9	1.0	0.5
White ash	1.8	...	1.0	0.4	...	...	0.5	...	...
Other ashes	8.5	...	2.8	1.3	3.0	0.7	0.3	0.3	...
Sycamore	5.0	...	0.4	0.5	...	0.9	0.5	2.6	0.2
Cottonwood	0.4	...	...	...	0.4	...	...	...	...
Basswood	1.2	...	0.7	0.5	...	...	...	...	...
Willow	0.3	...	0.3	...	...	...	...	...	...
Black cherry	4.0	...	1.8	0.5	0.7	0.9	...	...	...
American elm	3.8	...	0.8	0.9	0.7	...	0.3	1.2	...
Other elms	2.7	...	1.5	0.5	0.6	...	...	...	...
River birch	3.5	...	1.3	0.8	0.3	0.4	...	0.7	...
Hackberry	2.9	...	0.2	0.5	0.2	1.5	0.5	...	...
Other locusts	0.4	...	0.4	...	...	...	...	...	...
Holly	0.2	...	...	0.2	...	...	...	...	...
Total hardwoods	512.4	...	131.6	130.3	97.1	64.9	37.7	45.8	4.9
All species	1901.9	365.5	517.1	445.7	270.7	148.6	81.1	67.7	5.3

**Table 36—Volume of timber on timberland by species and class of timber,
Ouachita Counties, Arkansas, 1988**

Species	All live	Growing stock	Rough	Rotten
----- Million cubic feet -----				
Shortleaf pine	1946.1	1909.7	36.2	0.2
Loblolly pine	110.9	108.2	2.7	...
Redcedar	29.5	26.4	2.9	0.1
Cypress	6.2	6.2	...	...
Total softwoods	2092.7	2050.5	41.8	0.4
Select white oaks	377.8	332.4	35.3	10.1
Select red oaks	147.8	124.9	18.3	4.6
Other white oaks	255.1	203.8	45.0	6.3
Other red oaks	225.8	193.6	26.1	6.1
Sweet pecan	0.8	0.4	0.4	...
Water hickory	0.5	0.5	...	...
Other hickories	154.8	132.2	20.3	2.3
Persimmon	0.7	0.7	...	...
Hard maple	1.4	1.4	...	...
Soft maple	18.1	10.1	7.5	0.5
Boxelder	2.7	2.0	0.6	0.1
Beech	0.2	...	...	0.2
Sweetgum	184.8	170.5	11.4	2.9
Blackgum	57.4	43.8	6.8	6.9
Other gums/tupelos	0.3	0.3	...	...
White ash	5.5	4.4	0.7	0.3
Other ashes	24.4	22.1	2.2	0.2
Sycamore	7.9	6.8	0.6	0.5
Cottonwood	0.5	0.5	...	...
Basswood	3.9	3.4	0.2	0.3
Willow	1.2	1.2	...	...
Black cherry	15.4	10.9	4.1	0.4
American elm	15.1	10.8	2.9	1.4
Other elms	37.4	29.7	7.3	0.4
River birch	6.1	5.6	0.5	...
Hackberry	7.8	5.2	2.6	...
Black locust	0.2	...	0.2	...
Other locusts	1.8	1.1	0.7	...
Sassafras	0.7	...	0.7	...
Dogwood	0.1	...	0.1	...
Holly	0.3	0.3	...	...
Other commercial	1.6	0.4	1.2	...
Total hardwoods	1558.1	1319.0	195.6	43.5
Noncommercial	22.4	...	22.4	...
All species	3673.2	3369.6	259.7	43.9

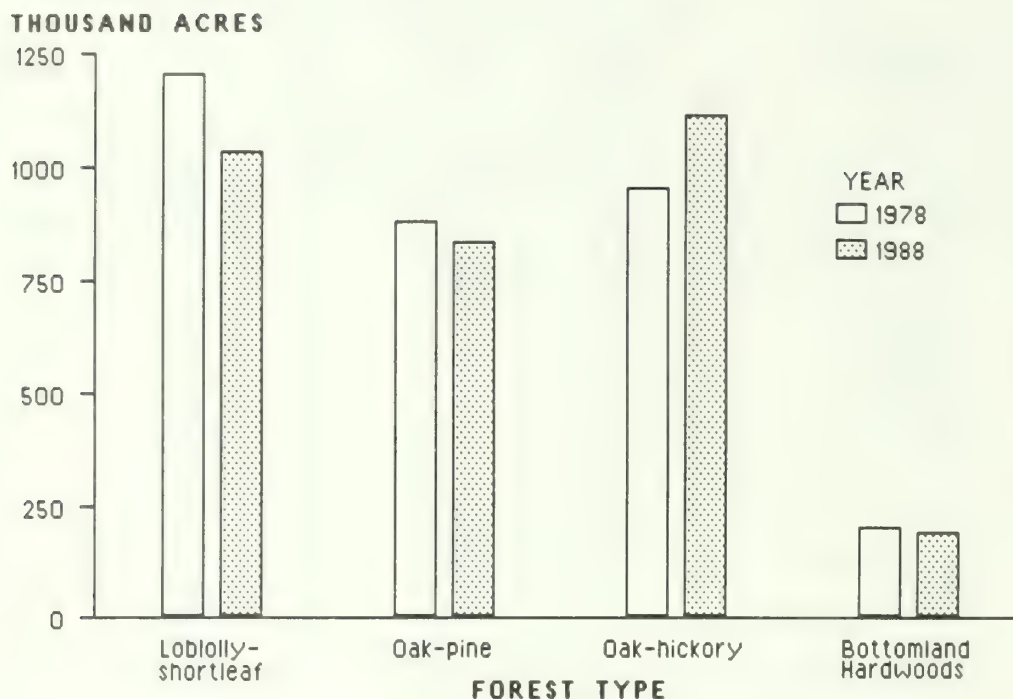


Figure 1.--Area of timberland by forest type, Ouachita Counties, Arkansas, 1978 and 1988.

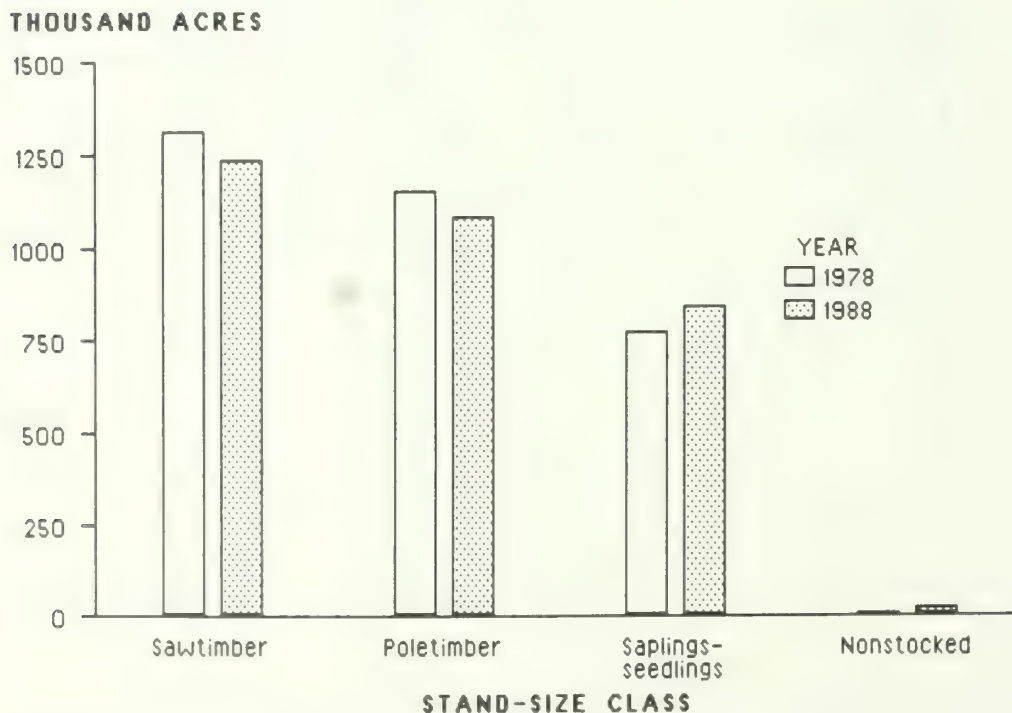


Figure 2.--Area of timberland by stand-size class, Ouachita Counties, Arkansas, 1978 and 1988.

MILLION CUBIC FEET

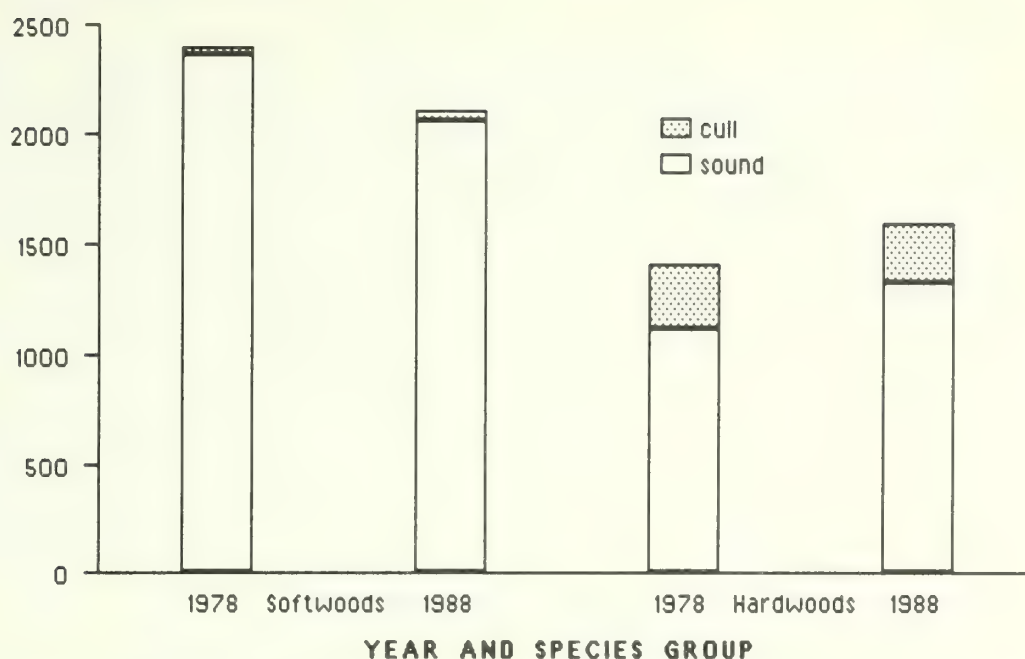


Figure 3.--Volume of timber on timberland by species group and class of timber, Ouachita Counties, Arkansas, 1978 and 1988.

MILLION CUBIC FEET

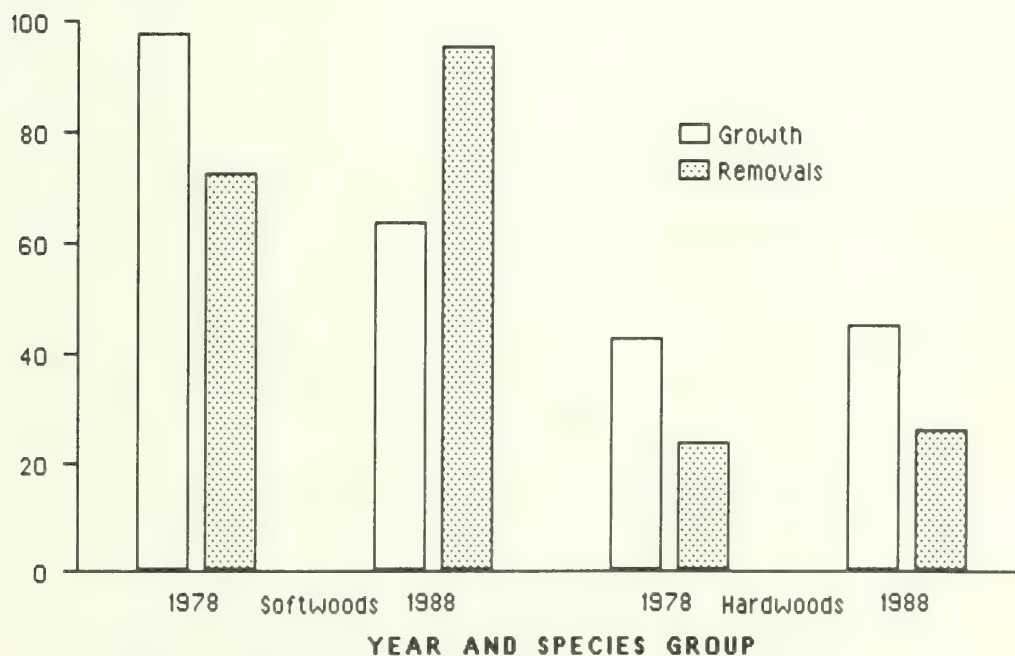


Figure 4.--Average net annual growth and average annual removals of growing stock on timberland by species group, Ouachita Counties, Arkansas, 1978 and 1988.

MILLION CUBIC FEET



Figure 5.--Volume of softwood growing stock on timberland by diameter class, Ouachita Counties, Arkansas, 1969, 1978, and 1988.

MILLION CUBIC FEET

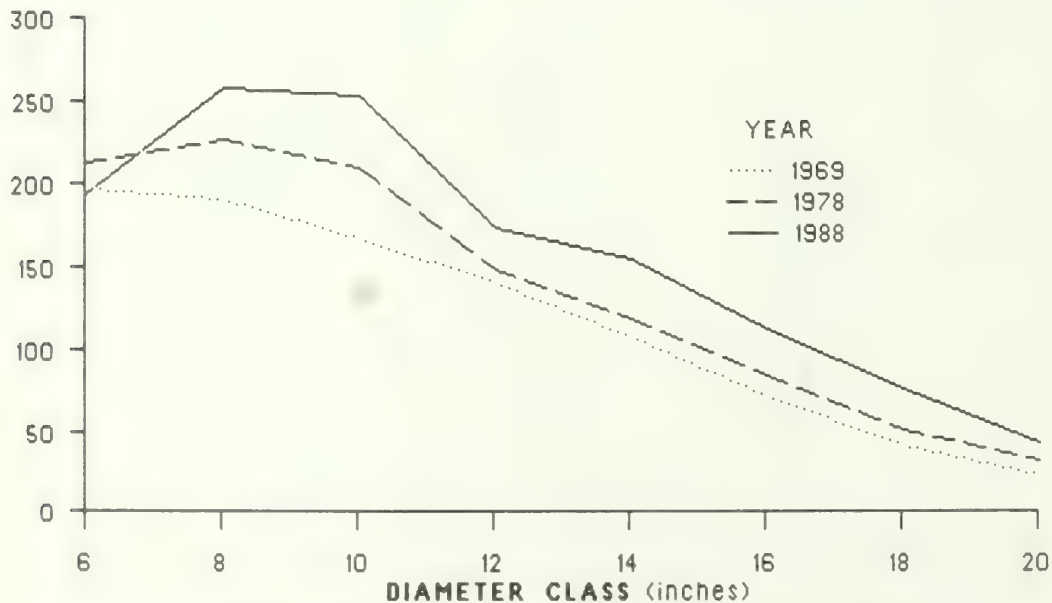


Figure 6.--Volume of hardwood growing stock on timberland by diameter class, Ouachita Counties, Arkansas, 1969, 1978, and 1988.

MILLION TREES

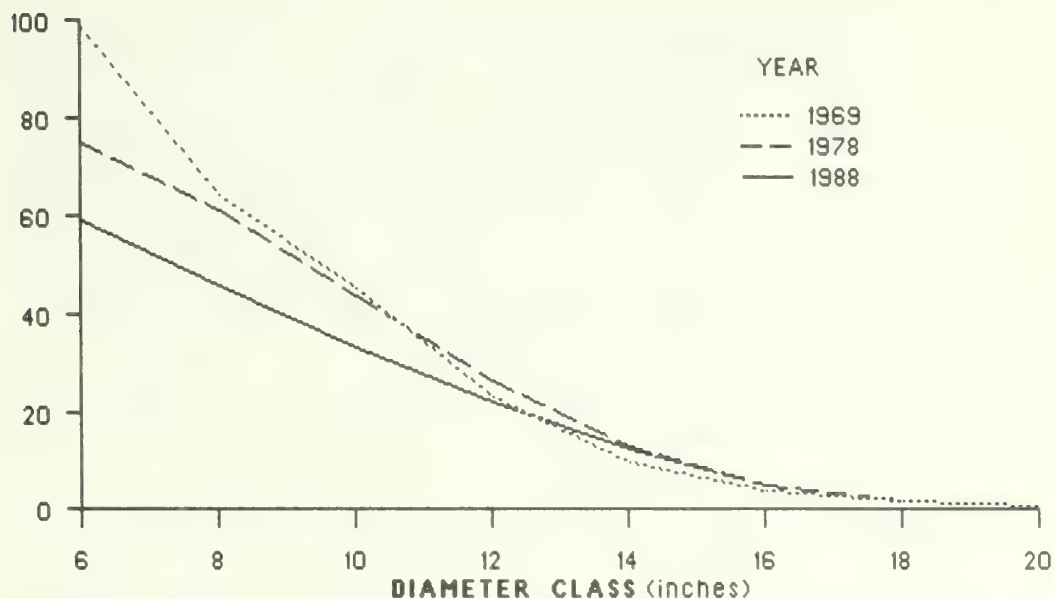


Figure 7.--Number of softwood growing-stock trees on timberland by diameter class, Ouachita Counties, Arkansas, 1969, 1978, and 1988.

MILLION TREES

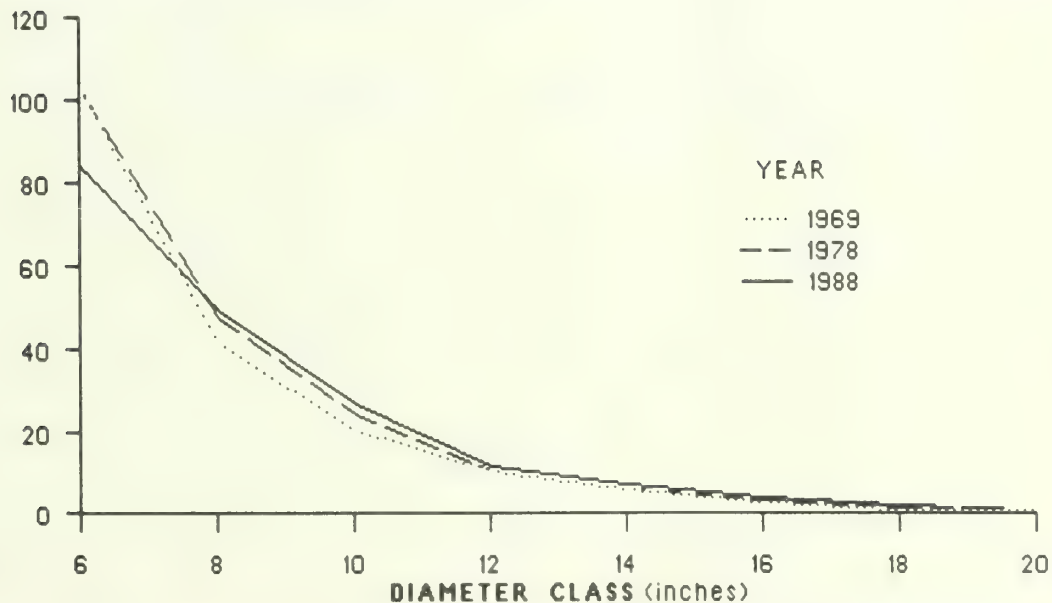


Figure 8.--Number of hardwood growing-stock trees on timberland by diameter class, Ouachita Counties, Arkansas, 1969, 1978, and 1988.

PERCENT CHANGE

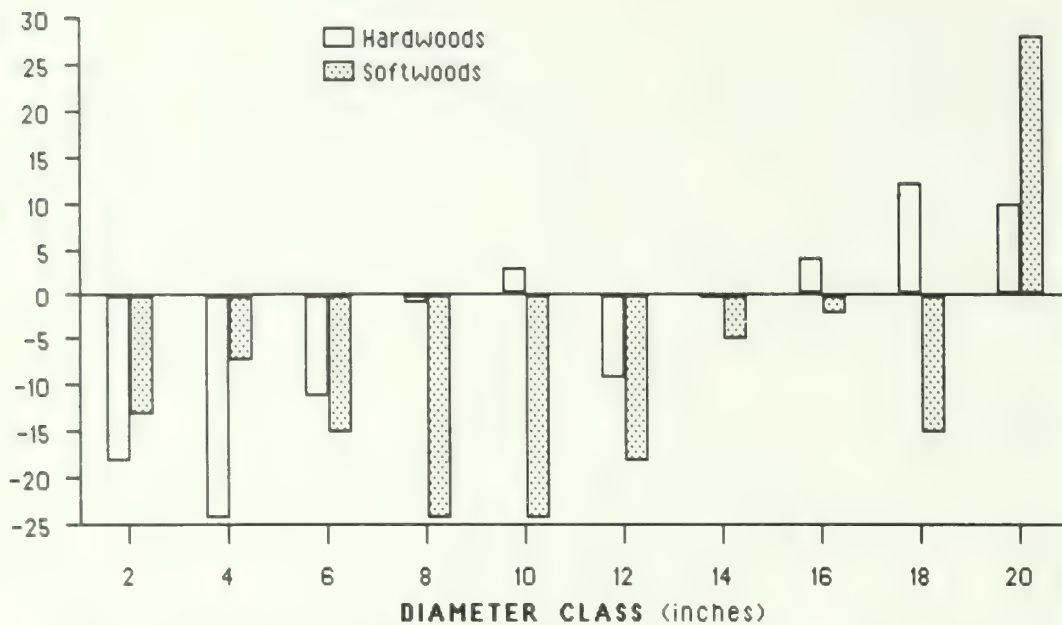


Figure 9.--Percent change in the number of live trees on timberland by species group and diameter class, Ouachita Counties, Arkansas, 1978 and 1988.

Hines, F. Dee, Forest Statistics for Arkansas' Ouachita Counties--1988. Resource Bull. SO-137. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 1988. 28 p.

Tabulates forest resource information from a new inventory of Arkansas' Ouachita Unit.

Additional Keywords: Area, volume, forest type, stand size, ownership.

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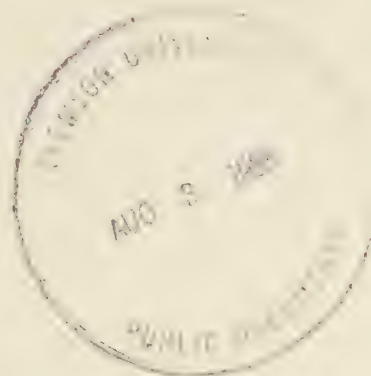
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Louisiana

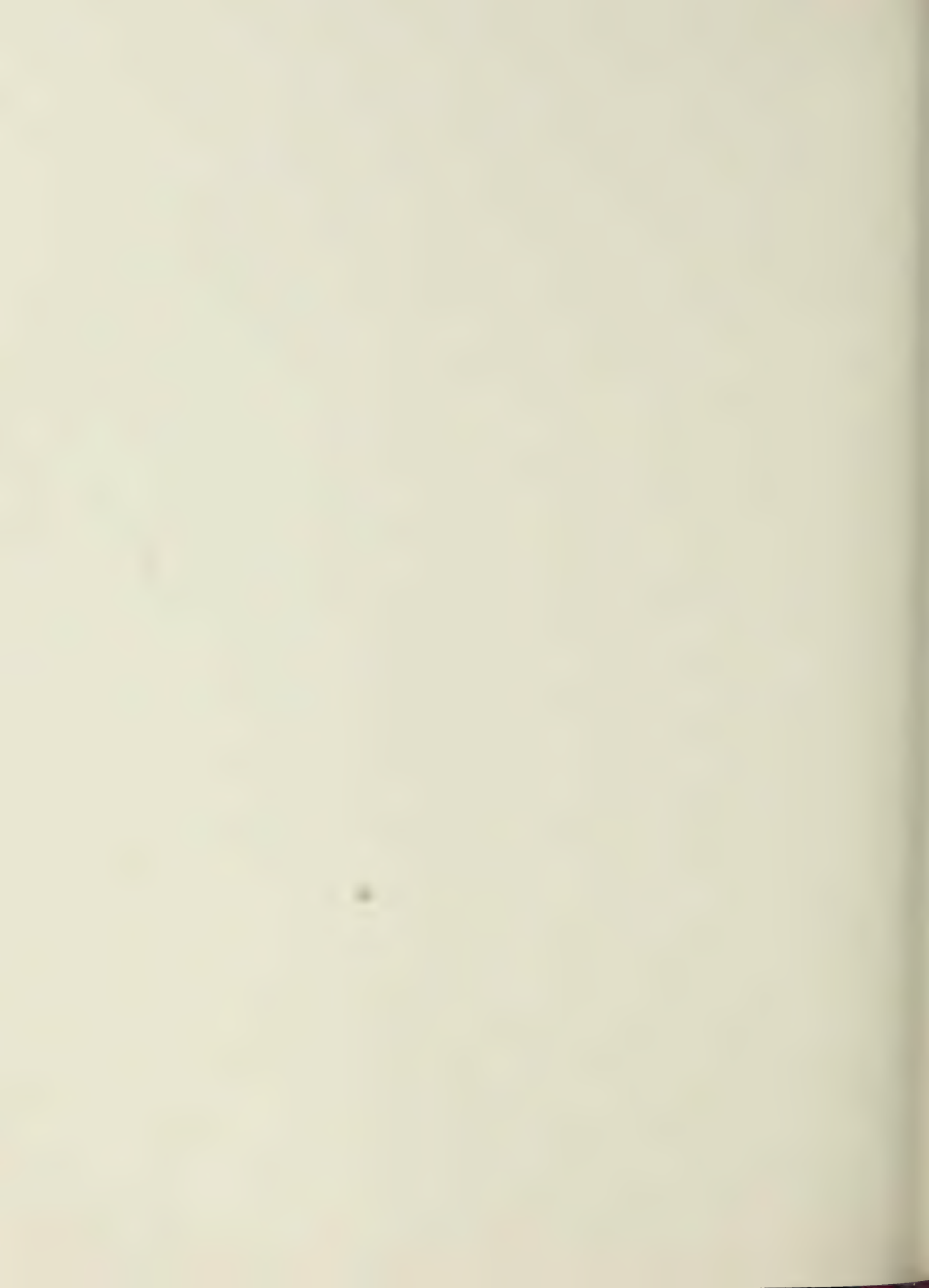
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Southern Pulpwood Production, 1986

Dennis M. May





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Southern Forest Experiment Station
New Orleans, Louisiana

and

Southeastern Forest Experiment Station
Asheville, North Carolina

of the

Forest Service, U.S. Department of Agriculture

in cooperation with the

American Pulpwood Association

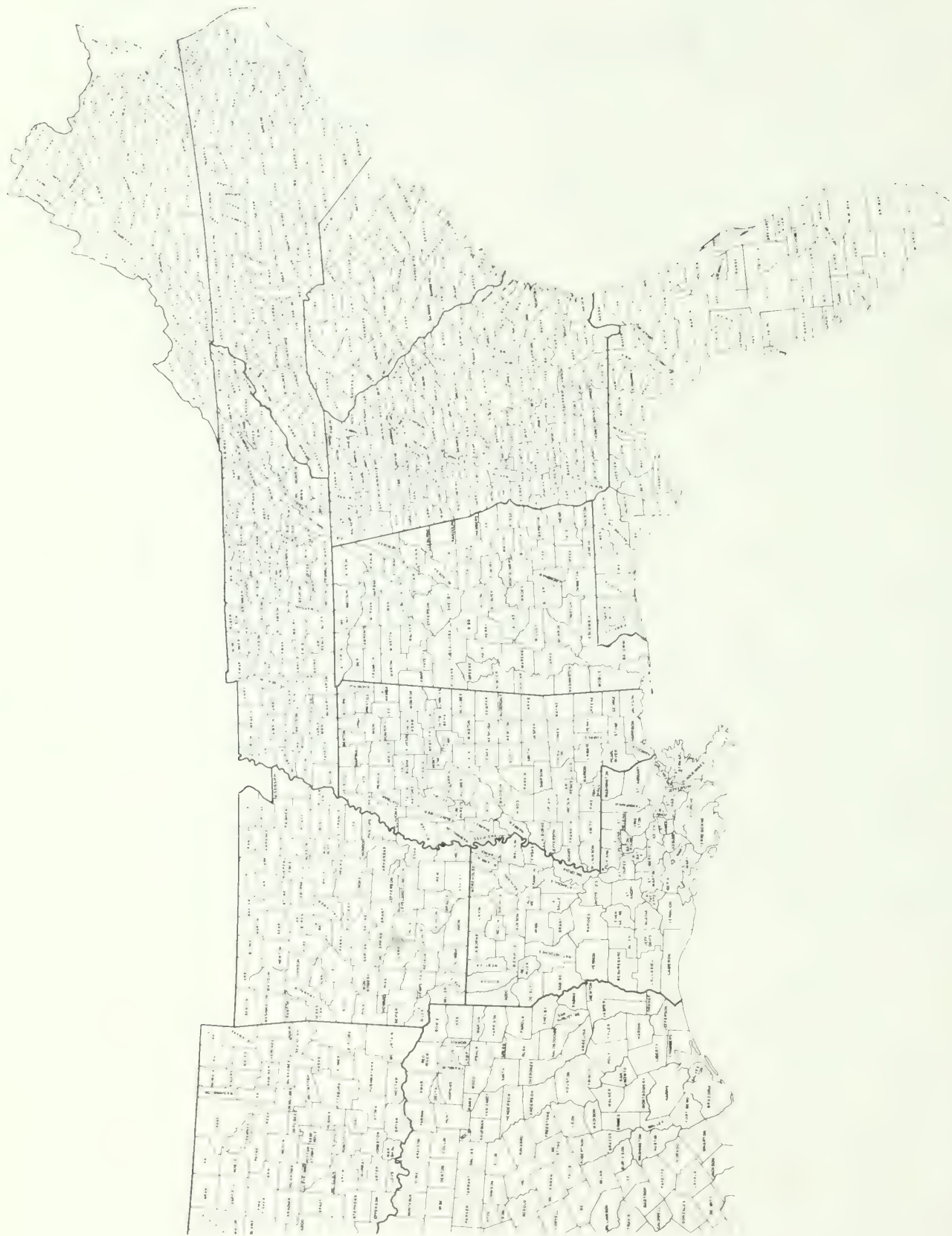


Figure 1.--The 12 Southern States and the counties in each.

Southern Pulpwood Production, 1986

Dennis M. May

INTRODUCTION

In this publication are presented the findings of a 100-percent canvass of all wood-using pulp mills drawing roundwood or wood residues from 12 Southern States (fig. 1). Canvass data are compiled annually and analyzed on an alternating basis by personnel of the Forest Inventory and Analysis Units of the Southern and Southeastern Forest Experiment Stations. All production figures are reported in standard cords. When necessary, pulpwood production data for mills reporting in nonstandard units are converted to standard cords using regional conversion factors.

PULPWOOD

Fueled by increased competitiveness, the result of a devalued American dollar, lower interest rates, and recent mill improvements, domestic pulp and paper products experienced a resurgence in demand in 1986. As expected, this resurgence had consequential effects on the demand for pulping fiber. In the South, pulpwood production climbed 6 percent above the 1985 level to top 60 million cords for the first time (table 1). Both regions in the South, Midsouth and Southeast, experienced a recovery in pulpwood production with respective gains of 9 and 4 percent in 1986. However, the Midsouth contributed 7 percent more to the 1986 production than did the Southeast (table 2). The State of Georgia was the leading producer of pulpwood in 1986. Alabama ranked a close second, and Mississippi, with a major increase in production, ranked third. Collectively, these three States supplied over 40 percent of the total production.

Softwoods continued to be the major source of pulpwood, comprising 70 percent of the total production in 1986. The production of softwood was split equally between the Midsouth and Southeast regions. In contrast, the

Table 1.--Pulpwood production in the South during 1986, and change since 1985

State	Pulpwood	Change
	Thousand cords	Percent
Alabama	9,584.4	6
Arkansas	4,477.9	8
Florida	4,109.7	4
Georgia	10,212.9	4
Louisiana	5,430.8	9
Mississippi	7,129.0	26
North Carolina	5,369.5	8
Oklahoma	586.3	-9
South Carolina	4,814.7	0
Tennessee	1,478.8	19
Texas	3,770.5	-9
Virginia	3,625.4	2
All States	60,589.8 ¹	6

1

Column data may not add due to rounding.

Table 2.--Pulpwood production in the Southeast and Midsouth, 1986

Region and source of wood	All species	Softwood	Hardwood
-----Standard cords-----			
1			
Southeast			
Roundwood	19,467,269	14,064,687	5,402,582
Residues	8,664,839	7,141,875	1,522,964
Total	28,132,108	21,206,562	6,925,546
2			
Midsouth			
Roundwood	20,972,574	13,050,381	7,922,193
Residues	11,485,081	8,425,839	3,059,242
Total	32,457,655	21,476,220	10,981,435
Entire South			
Roundwood	40,439,843	27,115,068	13,324,775
Residues	20,149,920	15,567,714	4,582,206
Total	60,589,763	42,682,782	17,906,981

1

States of Florida, Georgia, North Carolina, South Carolina, and Virginia.

2

States of Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, Tennessee, and Texas.

Table 3.--Roundwood production in the South, by State and species' group, 1986 and 1985

State	Change from 1985	1986			1985		
		All species	Softwood	Hardwood	All species	Softwood	Hardwood
<u>Percent</u>		<u>-----Thousand cords-----</u>					
Alabama	6	7,137.0	4,137.3	2,999.7	6,759.7	4,046.9	2,712.8
Arkansas	8	1,766.2	871.8	894.4	1,637.9	847.7	790.2
Florida	9	3,039.9	2,823.8	216.1	2,781.0	2,551.6	229.3
Georgia	9	7,125.5	5,883.7	1,241.8	6,529.3	5,443.4	1,085.8
Louisiana	5	3,731.6	2,773.5	958.0	3,567.1	2,686.1	881.0
Mississippi	29	4,935.6	2,979.4	1,956.2	3,839.0	2,236.4	1,602.6
North Carolina	11	3,655.1	2,105.6	1,549.5	3,294.8	1,915.2	1,379.5
Oklahoma	-56	104.3	55.5	48.8	238.6	72.0	166.6
South Carolina	-2	3,211.7	2,175.5	1,036.2	3,280.1	2,289.1	991.0
Tennessee	39	1,227.8	788.9	438.9	882.0	506.0	376.0
Texas	-3	2,070.2	1,444.0	626.2	2,129.3	1,573.3	556.0
Virginia	7	2,435.0	1,076.0	1,359.0	2,278.9	1,062.9	1,216.0
1							
All States	9	40,439.9	27,115.1	13,324.8	37,217.9	25,230.8	11,987.0

1

Row and column data may not add due to rounding.

Midsouth was the major supplier of hardwood pulpwood, furnishing over 60 percent of the total hardwood production. Both roundwood and wood residues contributed to the 1986 pulpwood production record. Roundwood, however, was the leading form of pulping fiber, outproducing wood residues by 2 to 1.

Roundwood

In line with the increase in pulpwood production, Southern roundwood production increased 9 percent in 1986 (table 3). This gain in roundwood accounted for 89 percent of the increase in pulpwood production in 1986. Roundwood harvests in the Midsouth and Southeast increased by 10 and 7 percent, respectively, in response to the heightened demand for pulpwood. However, the Midsouth still supplied the majority of the roundwood harvest (table 2).

The top three roundwood producing States were Alabama, Georgia, and Mississippi, in this order (table 4). Together, these three States supplied

almost half the total roundwood harvest in 1986. The top three roundwood producing States also contained over half the 114 counties in the South that harvested in excess of 100,000 cords of roundwood each (Appendix tables A1-A12, Appendix figures A1-A6). Once again, Florida's Taylor county was the leading

Table 4.--Roundwood production in the South, by State and species' group, 1986

State	All species	Softwood	Hardwood
<u>-----Thousand cords-----</u>			
Alabama	7,137.0	4,137.3	2,999.7
Arkansas	1,766.2	871.8	894.4
Florida	3,039.9	2,823.8	216.1
Georgia	7,125.5	5,883.7	1,241.8
Louisiana	3,731.6	2,773.5	958.0
Mississippi	4,935.6	2,979.4	1,956.2
North Carolina	3,655.1	2,105.6	1,549.5
Oklahoma	104.3	55.5	48.8
South Carolina	3,211.7	2,175.5	1,036.2
Tennessee	1,227.8	788.9	438.9
Texas	2,070.2	1,444.0	626.2
Virginia	2,435.0	1,076.0	1,359.0
1			
All States	40,439.9	27,115.1	13,324.8

1

Column data may not add due to rounding.

producer of roundwood, with a harvest in excess of 335,000 cords.

Softwoods were also the major source of roundwood, comprising two-thirds of the total roundwood harvest in 1986. However, as a result of the increased acceptance of hardwoods as a source of pulping fiber, hardwood harvests increased more than softwood harvests in 1986. The hardwood harvest increased by 11 percent, while that of softwoods only increased by 7 percent. This allowed hardwoods to account for over 40 percent of the total increase in roundwood in 1986. The Southeast was the leading supplier of softwood roundwood, while the Midsouth supplied most of the hardwood roundwood. At the State level, Georgia harvested the most softwood roundwood and Alabama harvested the most hardwood roundwood.

Wood Residues

In contrast to the 9 percent rise in roundwood, wood residue production only increased 2 percent in 1986 (table

5). This relatively small increase can be attributed to a 3-percent decline in Southeast wood residue production. Wood residue production increased 6 percent in the Midsouth in 1986. The Midsouth was also responsible for the majority of the wood residue production in 1986 (table 2). The three leading States, ranked in the order of production, were Georgia, Arkansas, and Alabama. These three States collectively accounted for 41 percent of all residue production.

As with roundwood production, softwoods comprised the predominant proportion of the wood residue production, accounting for three-quarters of the 1986 production. However, as with roundwood, the hardwoods have been seeing increased acceptance. In 1986, hardwood residue production increased 5 percent, in comparison to the 1-percent increase for softwood residues. As a result, hardwood residues accounted for 60 percent of the increase in wood residues in 1986. The Midsouth continued to be the leading producer of hardwood, furnishing twice the amount of

Table 5.--Southern output of wood residues for pulp manufacture, by State and species' group.
1986 and 1985

State	Change from 1985	1986			1985		
		All species	Softwood	Hardwood	All species	Softwood	Hardwood
<u>Percent</u>		<u>-----Thousand cords-----</u>					
Alabama	7	2,447.4	1,881.3	566.1	2,297.0	1,811.4	485.5
Arkansas	9	2,711.7	1,960.8	750.9	2,492.9	1,851.3	641.6
Florida	-8	1,069.9	1,025.6	44.2	1,165.0	1,136.8	28.1
Georgia	-7	3,087.4	2,819.0	268.4	3,309.5	2,956.9	352.5
Louisiana	18	1,699.3	1,324.8	374.4	1,435.8	1,124.2	311.6
Mississippi	20	2,193.4	1,522.7	670.7	1,835.2	1,359.0	476.2
North Carolina	3	1,714.3	1,205.0	509.3	1,671.8	1,115.3	556.4
Oklahoma	20	482.0	373.3	108.7	403.3	382.6	20.6
South Carolina	5	1,603.0	1,427.9	175.0	1,526.9	1,297.5	229.4
Tennessee	-30	250.9	47.6	203.4	357.8	39.8	317.9
Texas	-15	1,700.3	1,315.3	385.0	2,006.3	1,630.3	376.0
Virginia	-5	1,190.3	664.3	526.0	1,258.4	709.7	548.6
1							
All States	2	20,149.9	15,567.7	4,582.2	19,759.9	15,415.2	4,344.7

1

Row and column data may not add due to rounding.

Table 6.--Southern output of wood residues for pulp manufacture, by State and type of residue, 1986

State	1						
	Chips				Other residues		
	All types	All species	Softwood	Hardwood	All species	Softwood	Hardwood
-----Thousand cords-----							
Alabama	2,447.4	2,384.1	1,827.5	556.6	63.3	53.7	9.6
Arkansas	2,711.7	2,666.2	1,915.3	750.9	45.5	45.5	0.0
Florida	1,069.9	1,069.9	1,025.6	44.2	0.0	0.0	0.0
Georgia	3,087.4	3,066.9	2,798.5	268.4	20.5	20.5	0.0
Louisiana	1,699.3	1,699.3	1,324.8	374.4	0.0	0.0	0.0
Mississippi	2,193.4	2,136.0	1,496.6	639.4	57.4	26.1	31.3
North Carolina	1,714.3	1,694.6	1,195.1	499.5	19.7	9.9	9.8
Oklahoma	482.0	452.6	343.9	108.7	29.4	29.4	0.0
South Carolina	1,603.0	1,595.8	1,420.8	175.0	7.1	7.1	0.0
Tennessee	250.9	250.9	47.6	203.4	0.0	0.0	0.0
Texas	1,700.3	1,690.3	1,305.3	385.0	10.1	10.1	0.0
Virginia	1,190.3	1,163.0	652.4	510.6	27.4	12.0	15.4
2							
All States	20,149.9	19,869.5	15,353.4	4,516.1	280.4	214.3	66.1

1

Veneer cores, pole and piling trim, cull material, sawdust, and secondary residues.

2

Row and column data may not add due to rounding.

hardwood residues as the Southeast. The Midsouth also produced the majority of the softwood residues. Arkansas was the leading producer of hardwood residues, while Georgia led in softwood residue production.

Chips continued to be the predominant form of wood residues produced, accounting for 99 percent of the total wood residue production in 1986 (table 6). The dominance of chips was enhanced by a 3-percent increase in chip production and a 36-percent decline in the production of other residues in 1986. Softwood chips accounted for three-quarters of the 1986 chip production.

MILLS

In 1986, 105 Southern pulp mills were operating and drawing wood from the 12 Southern States (fig. 2). Although the number of mills has remained the same as in 1985, pulping capacity fell

to 119,825 tons per day (table 7). Alabama and Georgia led the South in the number of mills operating, with 15 mills each. However, Georgia led in pulping capacity by an 11 percent margin over Alabama. In addition, five pulp mills from outside the Southern region were also drawing wood from the South (table 8).

TRENDS

In the 10-year period from 1977 to 1986, pulping capacity in the South increased from 100,894 to 119,825 tons per day. In the same time period, the number of pulp mills decreased from 113 to 105. This simultaneous rise in capacity and drop in mills is a testimony to the increasing efficiency of existing mills as a result of recent mill improvements and modernization. To meet the new demand created by the 19-percent increase in pulping capacity, Southern pulpwood production climbed 24 percent in the 10-year period (fig. 3).

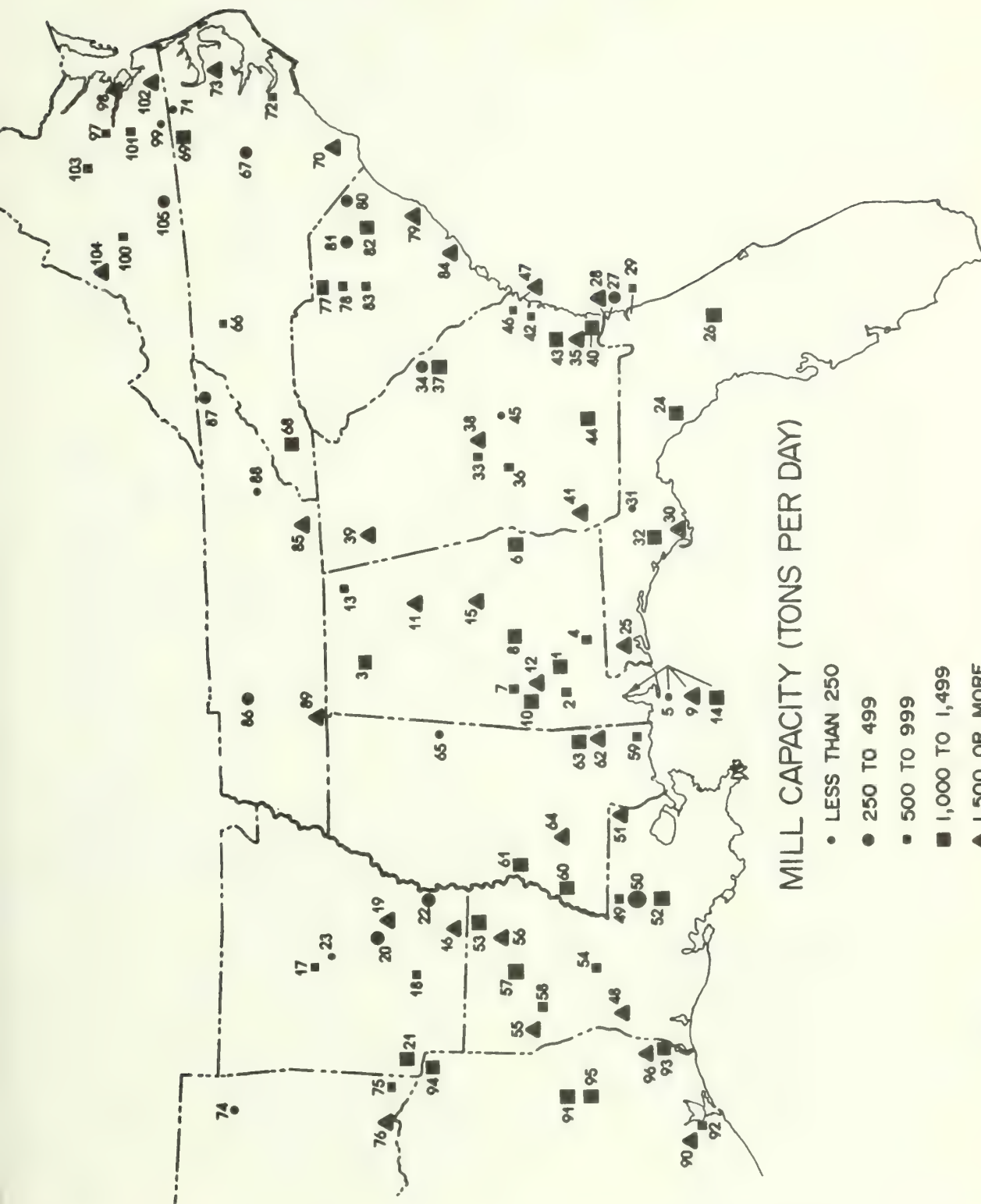


Figure 2.--1986 capacity of Southern pulp mills operating and drawing wood from the 12 Southern States. Numerals are coded to table 7.

Table 7.--Southern pulp mills, by process and capacity, 1986

			2 Pulping capacity, 24 hours				
Location	1 Map code	Company	All processes	Sulfate	Groundwood and other mechanical	Semi- chemical	Soda and sulfite
			----- Tons -----				
ALABAMA							
Claiborne	(1)	Alabama River Pulp Company	1,000	1,000	--	--	--
Jackson	(2)	Boise Cascade Paper Group	600	600	--	--	--
Courtland	(3)	Champion International Corporation	1,350	1,350	--	--	--
Brewton	(4)	Container Corporation of America	800	800	--	--	--
Mobile	(5)	GAF Corporation	50	--	50	--	--
Mahrt	(6)	Georgia Kraft Company, Alabama Div.	1,100	1,100	--	--	--
Demopolis	(7)	Gulf States Paper Corporation	525	525	--	--	--
Selma	(8)	Hammermill Paper Company	1,225	1,225	--	--	--
Mobile	(9)	International Paper Company	1,500	1,200	300	--	--
Naheola	(10)	James River Corporation	1,250	1,250	--	--	--
Coosa Pines	(11)	Kimberly-Clark Corporation	2,040	1,100	940	--	--
Pine Hill	(12)	McMillan Bloedel, Inc.	1,684	1,100	--	584	--
Stevenson	(13)	Mead Paperboard	900	--	--	900	--
Mobile	(14)	Scott Paper Company	1,450	1,450	--	--	--
Montgomery	(15)	Union Camp Corporation	2,300	2,300	--	--	--
Total			17,774	15,000	1,290	1,484	--
ARKANSAS							
Crossett	(16)	Georgia Pacific Corporation	1,500	1,500	--	--	--
Morrilton	(17)	Green Bay Packaging, Inc.	800	800	--	--	--
Camden	(18)	International Paper Company	750	750	--	--	--
Pine Bluff	(19)	International Paper Company	1,700	1,300	400	--	--
Pine Bluff	(20)	Mid-America Packaging, Inc.	300	300	--	--	--
Ashdown	(21)	Nekoosa Papers, Inc.	1,355	1,355	--	--	--
McGehee	(22)	Potlatch Corporation	450	450	--	--	--
Little Rock	(23)	Superwood Corporation	140	--	140	--	--
Total			6,995	6,455	540	--	--
FLORIDA							
Foley	(24)	The Buckeye Cellulose Corporation	1,000	1,000	--	--	--
Cantomont	(25)	Champion International Corporation	1,560	1,560	--	--	--
Palatka	(26)	Georgia Pacific Corporation	1,350	1,350	--	--	--
Fernandina Beach	(27)	Itt Rayonier, Inc.	450	--	--	--	450
Fernandina Beach	(28)	Jefferson Smurfit Corporation	1,900	1,900	--	--	--
Jacksonville	(29)	Jefferson Smurfit Corporation	760	760	--	--	--
Port St. Joe	(30)	St. Joe Paper Company	1,700	1,700	--	--	--
Blountstown	(31)	Southeastern Fiber Board	50	--	50	--	--
Panama City	(32)	Southwest Forest Industries, Inc.	1,465	1,465	--	--	--
Total			10,235	9,735	50	--	450
GEORGIA							
Macon	(33)	Armstrong World Industries	927	--	927	--	--
Augusta	(34)	Augusta Newsprint Company	1,200	--	1,200	--	--
Brunswick	(35)	Brunswick Pulp and Paper	1,820	1,820	--	--	--
Oglethorpe	(36)	The Buckeye Cellulose Corporation	860	860	--	--	--
Augusta	(37)	Federal Paper Board Company	1,000	600	400	--	--
Macon	(38)	Georgia Kraft Company, Mead Div.	1,500	1,500	--	--	--
Rome	(39)	Georgia Kraft Company, Krannert Div.	2,100	2,100	--	--	--

Table 7.--Southern pulp mills, by process and capacity, 1986--Continued

			2				
			Pulping capacity, 24 hours				
Location	1 Map code	Company	All processes	Sulfate	Groundwood	Soda	
					and other mechanical	Semi- chemical	and sulfite
			-Tons-				
St. Marys	(40)	Gilman Paper Co., St. Marys Kraft Div.	1,200	1,200	--	--	--
Cedar Springs	(41)	Great Southern Paper Company	2,500	2,000	--	500	--
Riceboro	(42)	InterState Paper Corporation	550	550	--	--	--
Jesup	(43)	I.T.T. Rayonier, Inc.	1,400	1,400	--	--	--
Valdosta	(44)	Owens-Illinois, Forest Products Div.	1,015	1,015	--	--	--
Dublin	(45)	Southeast Paper Mfg. Company	50	--	50	--	--
Port Wentworth	(46)	Stone Container	800	800	--	--	--
Savannah	(47)	Union Camp Corporation	2,800	2,800	--	--	--
Total			19,722	16,645	2,577	500	--
LOUISIANA							
DeRidder	(48)	Boise Cascade Corporation	2,160	1,260	900	--	--
St. Francisville	(49)	Crown Zellerbach Corporation	550	550	--	--	--
St. Francisville	(50)	Crown Zellerbach Corporation	255	--	255	--	--
Bogalusa	(51)	Gaylord Container Corporation	1,600	1,300	--	300	--
Port Hudson	(52)	Georgia-Pacific Corporation	1,300	1,300	--	--	--
Bastrop	(53)	International Paper Company	1,100	1,100	--	--	--
Pineville	(54)	International Paper Company	985	985	--	--	--
Mansfield	(55)	International Paper Company	1,900	1,400	--	500	--
West Monroe	(56)	Manville Forest Products Corporation	1,700	1,450	--	250	--
Hodge	(57)	Stone Container Corporation	1,300	1,300	--	--	--
Campti	(58)	Willamette Industries, Inc.	800	800	--	--	--
Total			13,650	11,445	1,155	1,050	--
MISSISSIPPI							
Moss Point	(59)	International Paper Company	700	700	--	--	--
Natchez	(60)	International Paper Company	1,100	1,100	--	--	--
Vicksburg	(61)	International Paper Company	1,180	1,180	--	--	--
Monticello	(62)	Georgia Pacific Corporation	1,620	1,620	--	--	--
New Augusta	(63)	Leaf River Forest Products	1,050	1,050	--	--	--
Laurel	(64)	Masonite Corporation	3,380	--	3,380	--	--
Columbus	(65)	Weyerhaeuser Company	220	--	--	220	--
Total			9,250	5,650	3,380	220	--
NORTH CAROLINA							
Roaring River	(66)	Abitibi--Price Corporation	500	--	500	--	--
Goldsboro	(67)	Celotex Corporation	300	--	300	--	--
Canton	(68)	Champion International Corporation	1,440	1,440	--	--	--
Roanoke Rapids	(69)	Champion International Corporation	1,100	1,100	--	--	--
Riegelwood	(70)	Federal Paper Board Company, Inc.	2,100	2,100	--	--	--
Conway	(71)	Georgia-Pacific Corporation	200	--	200	--	--
New Bern	(72)	Weyerhaeuser Company	740	740	--	--	--
Plymouth	(73)	Weyerhaeuser Company	1,680	1,450	--	230	--
Total			8,060	6,830	1,000	230	--
OKLAHOMA							
Pryor	(74)	Georgia Pacific Corporation	200	--	200	--	--
Broken Bow	(75)	Weyerhaeuser Company	920	--	920	--	--
Valliant	(76)	Weyerhaeuser Company	2,000	1,500	--	500	--
Total			3,120	1,500	1,120	500	--

Table 7.--Southern pulp mills, by process and capacity, 1986--Continued

			1				
			Pulping capacity, 24 hours				
Location	Map code	Company	All processes	Sulfate	Groundwood and other mechanical	Semi- chemical	Soda and sulfite
			Tons				
SOUTH CAROLINA							
Catawba	(77)	Bowaters Carolina Corporation	1,335	1,125	210	--	--
Catawba	(78)	Catawba Newsprint Company	500	--	500	--	--
Georgetown	(79)	International Paper Company	1,713	1,613	--	100	--
Marion	(80)	Masonite Corporation	450	--	450	--	--
Hartsville	(81)	Sonoco Products Company	280	--	--	280	--
Florence	(82)	Stone Container Corporation	1,400	1,400	--	--	--
Eastover	(83)	Union Camp Corporation	600	600	--	--	--
Charleston	(84)	Westvaco Corporation	2,200	2,200	--	--	--
Total			8,478	6,938	1,160	380	--
TENNESSEE							
Calhoun	(85)	Bowaters Southern Paper Corporation	2,590	690	1,900	--	--
New Johnsonville	(86)	Inland Container Corporation	400	--	--	400	--
Kingsport	(87)	Mead Paper	325	--	--	--	325
Knoxville	(88)	Tamko Asphalt Products, Inc.	180	--	180	--	--
Counce	(89)	Tennessee River Pulp and Paper Company	1,700	1,700	--	--	--
Total			5,195	2,390	2,080	400	325
TEXAS							
Houston	(90)	Champion International Corporation	1,850	650	1,200	--	--
Lufkin	(91)	Champion International Corporation	1,200	400	800	--	--
Pasadena	(92)	Champion International Corporation	600	600	--	--	--
Orange	(93)	Inland Container Corporation	1,200	1,200	--	--	--
Texarkana	(94)	International Paper Company	1,200	1,200	--	--	--
Diboll	(95)	Temple-EastTex, Inc.	1,430	--	1,430	--	--
Evadale	(96)	Temple-EastTex, Inc.	1,500	1,500	--	--	--
Total			8,980	5,550	3,430	--	--
VIRGINIA							
Ashland	(97)	Bear Island Paper Company	600	--	600	--	--
West Point	(98)	Chesapeake Corporation	1,505	1,505	--	--	--
Jarratt	(99)	Georgia Pacific Corporation	240	--	240	--	--
Big Island	(100)	Owens-Illinois, Forest Products Div.	575	--	--	575	--
Hopewell	(101)	Stone Container Corporation	970	970	--	--	--
Franklin	(102)	Union Camp Corporation	1,950	1,950	--	--	--
Riverville	(103)	Virginia Fiber Corporation	600	--	--	600	--
Covington	(104)	Westvaco Corporation	1,626	1,376	--	250	--
Danville	(105)	Wood Fiber Industries	300	--	300	--	--
Total			8,366	5,801	1,140	1,425	--
Total South			119,825	93,939	18,922	6,189	775

1

Corresponds to numbers at locations on mill capacity map, fig 2.

2

Southern Pulp and Paper Directory, Vol. 49, No. 11 (October 1986); and other sources.

Table 8.--Other mills using southern pulpwood in 1986, by process and capacity

		1				
		Pulping capacity, 24 hours				
Location	Company	All processes	Sulfate	Groundwood and other mechanical	Semi- chemical	Soda and sulfite
		<u>Tons</u>				
KENTUCKY						
Wickliffe	Westvaco Corporation	700	700	--	--	--
Hawesville	Willamette Industries	1010	--	--	1010	--
MARYLAND						
Luke	Westvaco Corporation	907	907	--	--	--
PENNSYLVANIA						
Roaring Springs	Appleton Papers, Inc.	180	180	--	--	--
Spring Grove	P.H. Glatfelter Company	550	550	--	--	--

¹ Southern Pulp and Paper Directory, Vol. 49, No. 11 (October 1986); and other sources.

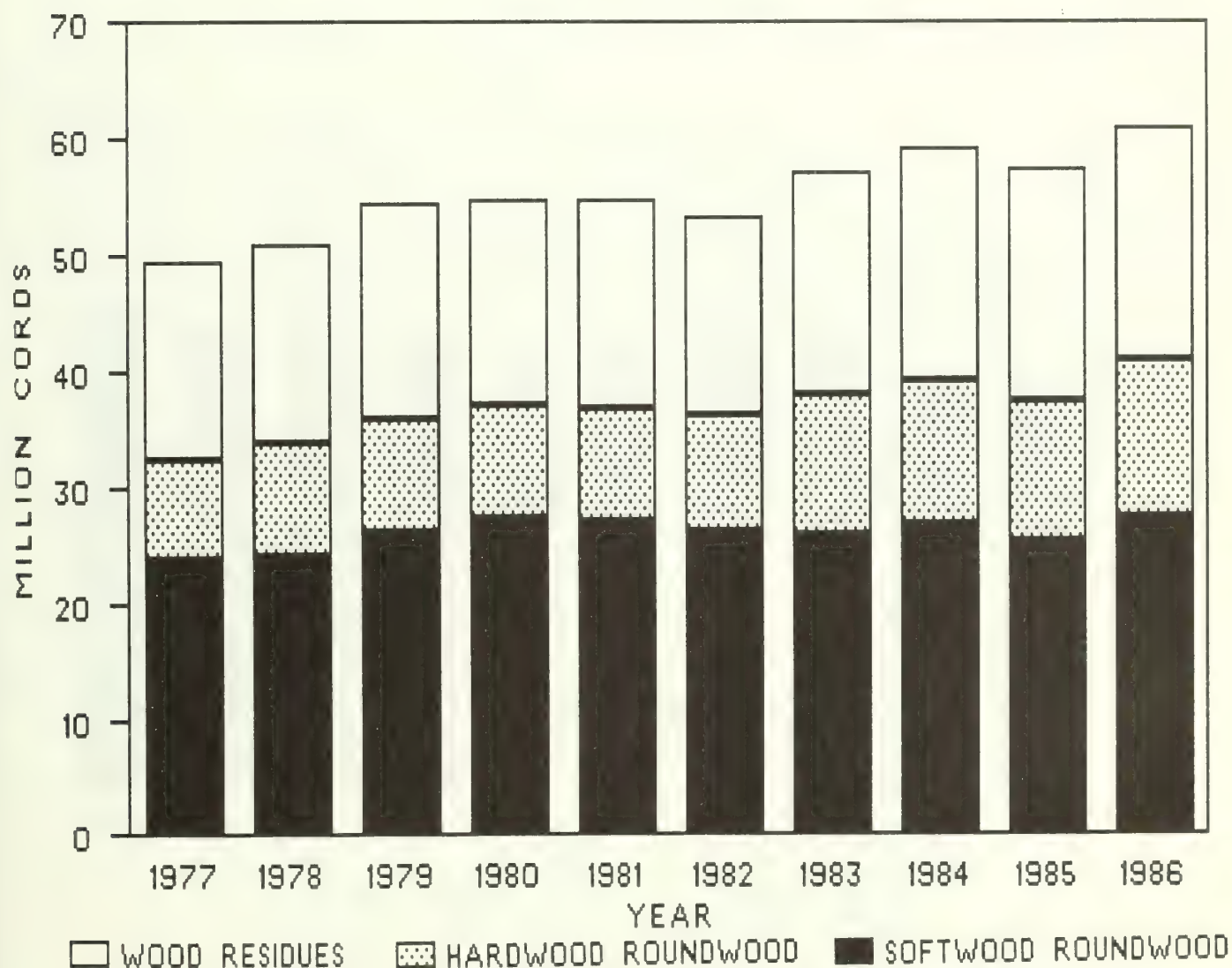


Figure 3.--1977-86 Southern pulpwood production.

In response to the increased demand for pulpwood, roundwood harvests climbed 26 percent and accounted for 70 percent of the total increase in pulpwood production over the 10-year period. Wood residues, which increased 20 percent over this period, supplied the remainder. However, since 1983, wood residue production has stabilized at approximately 20 million cords (fig. 3). This leveling off in the utilization of wood residues is expected

because wood residue supplies are not unlimited. Wood residue supplies are fixed by the level of activity in the primary wood processing industry in any given year.

Over the 1977-86 period, softwoods have been the predominant source of Southern pulpwood (fig. 4). However, the proportion of softwoods to total production has fallen from 77 percent in 1977 to 70 percent in 1986. The availability of hardwood fiber and advances in pulping technology have

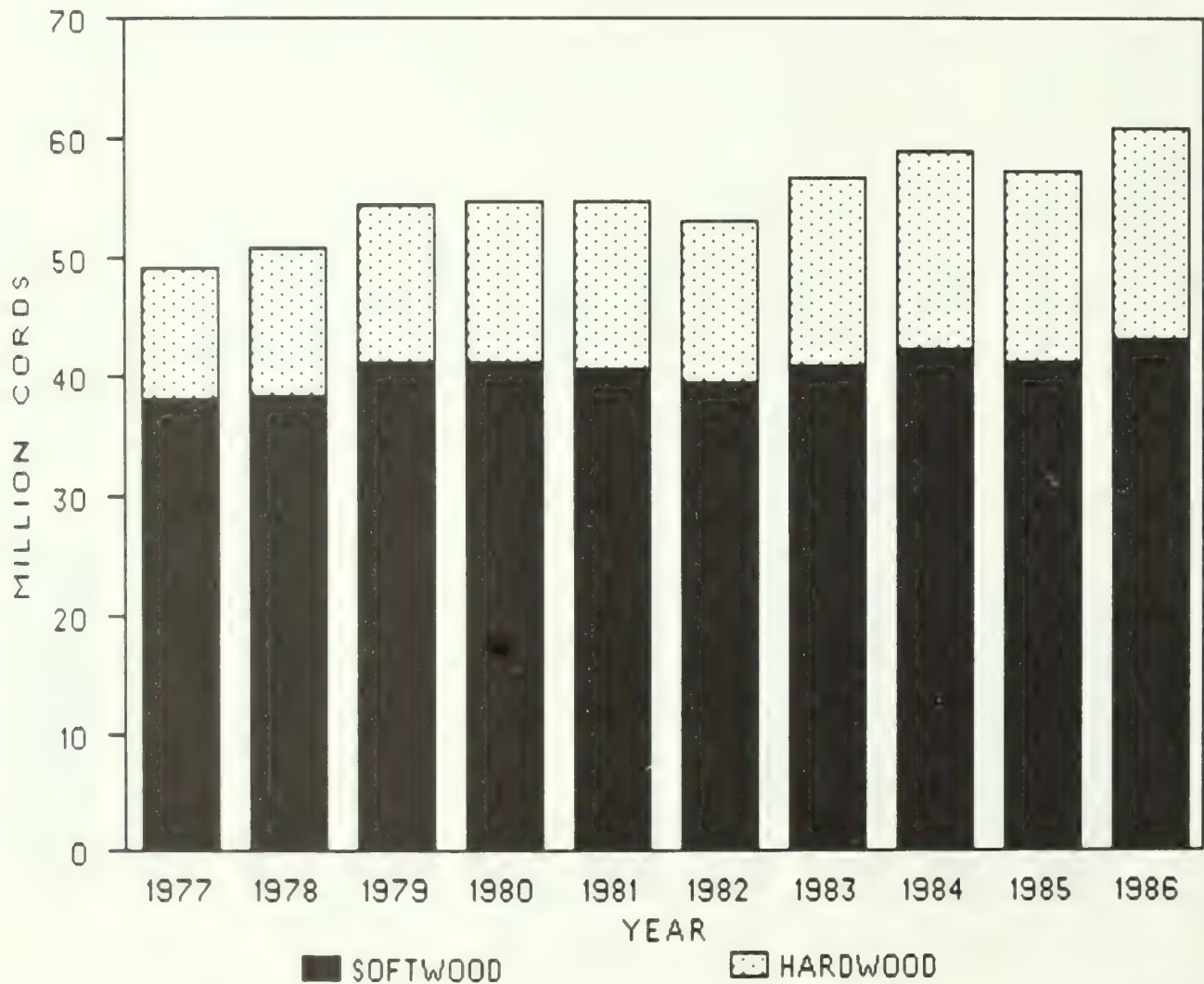


Figure 4.--1977-86 Southern pulpwood production by species group.

resulted in increasing acceptance of hardwoods as a source of pulping fiber. As a result, hardwoods have been capturing increasingly larger proportions of the total pulpwood harvest. Over the 10-year period, hardwood production increased by 60 percent, more than four times the increase experienced by softwoods. As a consequence, the increased hardwood harvest was responsible for 57 percent of the total increase in pulpwood production.

If these trends hold, any future increases in Southern pulping capacity will likely be met by increased production of roundwood, because wood residue production is limited. Additionally, hardwoods should continue to command a larger share of the total pulpwood furnish as long as the hardwood resource remains in abundant supply and technology continues to make headway into improved hardwood utilization.

Appendix

Table A-1.--Round pulpwood production in Alabama, 1986

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Autauga	144,380	82,914	61,466
Baldwin	218,431	126,536	91,895
Barbour	86,115	57,078	29,037
Bibb	112,665	79,566	33,098
Blount	55,761	38,431	17,330
Bullock	64,115	42,287	21,828
Butler	235,523	107,843	127,680
Calhoun	39,029	34,765	4,264
Chambers	83,472	57,082	26,390
Cherokee	24,109	19,186	4,923
Chilton	79,939	43,501	36,438
Choctaw	270,100	113,502	156,598
Clarke	293,831	126,539	167,292
Clay	81,976	59,704	22,272
Cleburne	50,768	42,667	8,101
Coffee	75,339	44,046	31,294
Colbert	65,845	31,923	33,921
Conecuh	150,333	78,833	71,500
Coosa	97,558	58,175	39,382
Covington	66,673	38,576	28,097
Crenshaw	75,871	34,273	41,598
Cullman	96,888	73,394	23,494

Table A-1.--Round pulpwood production in Alabama, 1986--Continued

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Dale	60,814	28,326	32,488
Dallas	142,031	52,973	89,058
De Kalb	34,824	19,566	15,258
Elmore	55,394	33,319	22,075
Escambia	125,666	81,603	44,064
Etowah	31,656	24,349	7,308
Fayette	133,827	73,131	60,697
Franklin	210,480	136,198	74,281
Geneva	29,262	14,238	15,024
Greene	101,556	37,531	64,025
Hale	63,171	21,332	41,839
Henry	72,569	38,947	33,622
Houston	55,826	38,097	17,729
Jackson	36,271	10,540	25,730
Jefferson	133,362	105,359	28,003
Lamar	59,091	43,878	15,213
Lauderdale	37,626	16,069	21,557
Lawrence	22,839	10,585	12,254
Lee	67,114	49,181	17,934
Limestone	7,597	4,375	3,222
Lowndes	113,206	48,312	64,894
Macon	55,882	30,332	25,550
Madison	1,768	1,434	335
Marengo	176,404	81,657	94,746
Marion	271,315	199,313	72,002
Marshall	24,004	16,090	7,914
Mobile	114,523	50,615	63,908
Monroe	228,041	107,719	120,322
Montgomery	80,971	46,425	34,546
Morgan	24,586	15,528	9,057
Perry	109,452	35,538	73,914
Pickens	181,042	82,816	98,226
Pike	139,977	58,650	81,327
Randolph	94,506	66,624	27,883
Russell	56,887	45,852	11,035
St. Clair	59,078	53,342	5,736
Shelby	94,850	71,302	23,547
Sumter	106,552	55,388	51,164

Table A-1.--Round pulpwood production in Alabama, 1986--Continued

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Talladega	153,603	130,381	23,222
Tallapoosa	115,409	72,279	43,130
Tuscaloosa	117,700	69,235	48,466
Walker	278,235	225,037	53,197
Washington	184,364	92,174	92,191
Wilcox	204,762	91,083	113,678
Winston	200,139	159,754	40,385
All counties	7,136,955	4,137,299	2,999,655

1

Counties with no pulpwood production are omitted.

Table A-2.--Round pulpwood production in Arkansas, 1986

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Arkansas	302	3	300
Ashley	119,505	52,948	66,556
Baxter	3	3	0
Benton	4	4	0
Boone	5	5	0
Bradley	134,682	26,533	108,149
Calhoun	57,354	43,924	13,430
Carroll	28	28	0
Chicot	3,968	11	3,957
Clark	39,346	21,476	17,870
Clay	10	10	0
Cleburne	10,004	7,293	2,711
Cleveland	47,151	23,536	23,614
Columbia	105,454	77,749	27,705
Conway	9,272	5,756	3,516
Craighead	5	5	0
Crawford	2	2	0
Cross	11	11	0
Dallas	57,566	24,702	32,864
Desha	46	46	0
Drew	125,470	34,992	90,477
Faulkner	2,072	74	1,998
Franklin	2,465	1,790	675
Fulton	20	9	12
Garland	304	11	293
Grant	51,207	23,371	27,836
Greene	11	11	0

Table A-2.--Round pulpwood production in Arkansas, 1986--Continued

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Hempstead	47,638	27,239	20,399
Hot Spring	36,230	16,499	19,731
Howard	25,754	8,840	16,914
Independence	2	2	0
Jackson	7	0	7
Jefferson	43,459	17,123	26,336
Johnson	8,316	5,817	2,499
Lafayette	57,793	34,629	23,164
Lincoln	5,033	1,874	3,159
Little River	84,172	40,307	43,865
Logan	12,386	9,673	2,713
Lonoke	1,666	0	1,666
Miller	60,716	32,016	28,700
Montgomery	14,923	7,176	7,747
Nevada	66,328	48,198	18,130
Newton	11	4	8
Ouachita	90,441	65,720	24,721
Perry	12,228	4,252	7,976
Phillips	5	5	0
Pike	21,718	13,444	8,274
Poinsett	40	20	20
Polk	18,002	8,579	9,423
Pope	10,811	7,586	3,226
Prairie	791	0	791
Pulaski	17,262	1,914	15,348
St. Francis	9	0	9
Saline	36,732	20,262	16,471
Scott	18,076	8,407	9,669
Sebastian	104	65	39
Sevier	50,471	15,658	34,813
Union	221,418	112,804	108,614
Van Buren	19,219	8,735	10,484
Washington	9	6	4
White	3,776	2,791	985
Woodruff	10	10	0
Yell	14,358	7,821	6,537
All counties	1,766,184	871,779	894,406

1 Counties with no pulpwood production are omitted.

Table A-3.--Round pulpwood production in Florida, 1986

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Alachua	80,108	61,867	18,241
Baker	35,609	35,553	56
Bay	84,821	84,561	260
Bradford	59,913	58,455	1,458
Brevard	2,852	2,852	0
Calhoun	173,061	171,811	1,250
Citrus	6,521	5,182	1,339
Clay	46,299	43,374	2,925
Columbia	79,790	76,942	2,848
Dixie	66,056	45,788	20,268
Duval	44,734	43,217	1,517
Escambia	63,881	55,986	7,895
Flagler	63,483	61,590	1,893
Franklin	21,364	21,276	88
Gadsden	68,801	51,198	17,603
Gilchrist	47,375	46,032	1,343
Glades	2,500	2,500	0
Gulf	44,552	44,447	105
Hamilton	63,696	62,540	1,156
Hendry	39,435	39,435	0
Hernando	992	278	714
Holmes	41,044	34,271	6,773
Indian River	2,407	2,407	0
Jackson	105,855	81,244	24,611
Jefferson	42,417	41,906	511
Lafayette	65,038	65,038	0
Lake	5,264	4,907	357
Leon	33,435	32,553	882
Levy	126,305	106,037	20,268
Liberty	66,865	66,720	145
Madison	51,435	32,616	18,819
Manatee	13,475	13,475	0
Marion	106,928	98,714	8,214
Nassau	188,995	171,556	17,439
Okaloosa	19,021	12,707	6,314
Okeechobee	2,500	2,500	0
Orange	2,407	2,407	0
Osceola	2,500	2,500	0

Table A-3.--Round pulpwood production in Florida, 1986--Continued

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Pasco	11,966	11,966	0
Polk	2,500	2,500	0
Putnam	58,932	53,575	5,357
St. Johns	96,270	91,505	4,765
St. Lucie	2,407	2,407	0
Santa Rosa	45,611	44,528	1,083
Sumter	9,488	9,488	0
Suwannee	83,781	83,259	522
Taylor	335,292	334,667	625
Union	40,879	39,419	1,460
Volusia	105,731	102,468	3,263
Wakulla	74,851	74,237	614
Walton	129,008	119,816	9,192
Washington	71,433	67,484	3,949
All counties	3,039,883	2,823,761	216,122

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Counties with no pulpwood production are omitted.

Table A-4.--Round pulpwood production in Georgia, 1986

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Appling	165,575	146,607	18,968
Atkinson	121,850	118,597	3,253
Bacon	93,123	89,913	3,210
Baker	13,877	11,943	1,934
Baldwin	45,812	33,549	12,263
Banks	32,140	29,872	2,268
Barrow	21,660	19,421	2,239
Bartow	51,742	51,177	565
Ben Hill	93,389	62,191	31,198
Berrien	19,335	19,243	92
Bibb	10,734	10,730	4
Bleckley	5,850	329	5,521
Brantley	68,768	56,157	12,611

Table A-4.--Round pulpwood production in Georgia, 1986--Continued

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Brooks	23,181	22,853	328
Bryan	117,261	83,372	33,889
Bulloch	123,548	110,840	12,708
Burke	105,456	47,579	57,877
Butts	29,885	28,669	1,216
Calhoun	46,118	34,161	11,957
Camden	178,720	169,149	9,571
Candler	27,551	18,523	9,028
Carroll	84,384	77,730	6,654
Catoosa	5,830	5,830	0
Charlton	161,036	148,364	12,672
Chatham	46,493	36,419	10,074
Chattahoochee	3,244	2,569	675
Chattooga	47,489	31,935	15,554
Cherokee	48,666	46,899	1,767
Clarke	5,259	2,836	2,423
Clay	21,641	16,457	5,184
Clinch	175,571	166,843	8,728
Cobb	22,997	22,397	600
Coffee	102,006	86,259	15,747
Colquitt	64,153	62,755	1,398
Columbia	19,690	1,370	18,320
Cook	16,761	14,738	2,023
Coweta	20,896	20,276	620
Crawford	77,880	74,126	3,754
Crisp	24,365	21,339	3,026
Dade	12,069	1,724	10,345
Dawson	8,742	8,526	216
Decatur	62,721	42,773	19,948
De Kalb	4,453	4,453	0
Dodge	81,543	69,029	12,514
Dooly	10,650	10,484	166
Dougherty	16,455	11,773	4,682
Douglas	30,136	29,836	300
Early	59,996	48,459	11,537
Echols	36,825	34,559	2,266
Effingham	146,129	106,725	39,404
Elbert	14,036	8,961	5,075
Emanuel	86,647	63,530	23,117
Evans	89,944	68,233	21,711
Fannin	5,584	4,317	1,267
Fayette	10,032	9,941	91
Floyd	86,361	82,356	4,005
Forsyth	14,293	14,035	258
Franklin	48,231	35,475	12,756
Fulton	29,302	27,976	1,326

Table A-4.--Round pulpwood production in Georgia, 1986--Continued

1	All		
County	species	Softwood	Hardwood
-----Standard cords-----			
Gilmer	4,741	4,693	48
Glascock	7,508	10	7,498
Glynn	167,991	127,841	40,150
Gordon	51,139	50,294	845
Grady	42,663	38,094	4,569
Greene	20,713	11,420	9,293
Gwinnett	30,774	28,534	2,240
Habersham	59,113	54,059	5,054
Hall	33,263	30,996	2,267
Hancock	79,440	50,531	28,909
Haralson	31,431	28,644	2,787
Harris	3,904	3,354	550
Hart	19,141	14,742	4,399
Heard	50,365	46,798	3,567
Henry	66,223	60,918	5,305
Houston	29,136	25,480	3,656
Irwin	839	796	43
Jackson	28,610	21,871	6,739
Jasper	25,924	25,924	0
Jeff Davis	43,368	40,076	3,292
Jefferson	66,528	48,073	18,455
Jenkins	35,834	15,898	19,936
Johnson	24,513	20,168	4,345
Jones	36,379	34,048	2,331
Lamar	13,708	13,708	0
Lanier	30,063	28,029	2,034
Laurens	81,080	58,567	22,513
Lee	17,228	14,942	2,286
Liberty	86,037	62,088	23,949
Lincoln	37,039	23,808	13,231
Long	162,537	136,754	25,783
Lowndes	33,541	30,724	2,817
Lumpkin	11,874	10,962	912
McDuffie	16,988	14,519	2,469
McIntosh	147,672	131,357	16,315
Macon	42,420	41,958	462
Madison	16,202	13,934	2,268
Marion	16,116	12,310	3,806
Meriwether	49,455	38,346	11,109
Miller	16,367	11,557	4,810
Mitchell	34,604	31,458	3,146
Monroe	77,124	77,124	0
Montgomery	23,423	16,366	7,057
Morgan	19,089	15,481	3,608

Table A-4.--Round pulpwood production in Georgia, 1986--Continued

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Murray	47,694	47,382	312
Muscogee	1,272	1,208	64
Newton	4,057	4,057	0
Oconee	19,126	13,995	5,131
Oglethorpe	72,731	61,939	10,792
Paulding	15,667	15,247	420
Peach	4,190	4,190	0
Pickens	25,232	24,992	240
Pierce	32,563	25,954	6,609
Pike	36,529	32,305	4,224
Polk	22,841	20,054	2,787
Pulaski	29,378	26,900	2,478
Putnam	18,656	16,997	1,659
Quitman	42,515	32,896	9,619
Rabun	1,908	154	1,754
Randolph	65,214	55,371	9,843
Richmond	23,738	17,049	6,689
Schley	29,531	21,726	7,805
Screven	51,276	30,679	20,597
Seminole	4,772	4,713	59
Spalding	14,471	14,471	0
Stephens	10,920	10,057	863
Stewart	61,037	51,813	9,224
Sumter	43,488	39,906	3,582
Talbot	8,785	6,927	1,858
Taliaferro	22,417	16,930	5,487
Tattnall	77,702	58,955	18,747
Taylor	20,373	19,943	430
Telfair	45,735	39,432	6,303
Terrell	17,225	14,719	2,506
Thomas	54,845	44,008	10,837
Tift	15,156	14,199	957
Toombs	55,556	39,678	15,878
Towns	2,453	2,453	0
Treutlen	14,059	10,031	4,028
Troup	63,704	59,352	4,352
Turner	2,085	2,085	0
Twiggs	44,628	31,476	13,152
Union	6,295	6,181	114
Upson	40,133	39,809	324

Table A-4.--Round pulpwood production in Georgia, 1986--Continued

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Walker	28,380	27,191	1,189
Walton	3,728	297	3,431
Ware	107,482	104,879	2,603
Warren	64,409	31,952	32,457
Washington	65,464	23,503	41,961
Wayne	161,662	133,215	28,447
Webster	17,454	15,370	2,084
Wheeler	46,743	36,477	10,266
White	24,398	22,131	2,267
Whitfield	63,239	40,604	22,635
Wilcox	23,731	21,687	2,044
Wilkes	144,564	100,955	43,609
Wilkinson	49,286	26,239	23,047
Worth	64,825	64,568	257
All counties	7,125,514	5,883,737	1,241,777

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Counties with no pulpwood production are omitted.

Table A-5.--Round pulpwood production in Louisiana, 1986

1 Parish	All species	Softwood	Hardwood
-----Standard cords-----			
Acadia	3,704	3,689	15
Allen	84,015	79,748	4,267
Ascension	2,298	675	1,623
Avoyelles	16,174	1,435	14,739
Beauregard	256,236	250,385	5,851
Bienville	218,441	168,751	49,691
Bossier	89,155	62,471	26,684
Caddo	59,602	38,839	20,764
Calcasieu	43,125	42,883	242
Caldwell	92,927	47,115	45,812
Cameron	29	19	11
Catahoula	33,865	11,268	22,597
Claiborne	153,570	126,805	26,764
Concordia	25,381	10	25,370
De Soto	173,221	120,305	52,916
East Baton Rouge	3,510	1,718	1,792
East Carroll	10,291	0	10,291
East Feliciana	18,712	9,147	9,565
Evangeline	29,015	27,255	1,760
Franklin	7,523	466	7,057
Grant	99,014	79,089	19,926

Table A-5.--Round pulpwood production in Louisiana, 1986--Continued

1 Parish	All species	Softwood	Hardwood
-----Standard cords-----			
Iberia	10	0	10
Iberville	3,623	17	3,606
Jackson	178,949	141,540	37,409
Jefferson	9	4	5
Jefferson Davis	3,464	3,461	4
Lafayette	4,146	3,545	600
La Salle	138,666	121,343	17,324
Lincoln	114,232	88,190	26,042
Livingston	19,727	10,666	9,061
Madison	24,953	15	24,938
Morehouse	53,000	18,852	34,148
Natchitoches	186,021	138,759	47,261
Ouachita	105,577	56,301	49,277
Pointe Coupee	1,102	0	1,102
Rapides	174,042	163,385	10,657
Red River	54,568	39,688	14,881
Richland	2,202	97	2,105
Sabine	224,589	173,568	51,021
St. Charles	81	0	81
St. Helena	39,215	25,921	13,294
St. James	102	0	102
St. Landry	400	50	350
St. Martin	1,035	0	1,035
St. Tammany	31,160	30,018	1,143
Tangipahoa	27,200	18,696	8,504
Tensas	40,887	118	40,769
Union	255,059	147,322	107,737
Vermilion	2	2	0
Vernon	274,447	254,959	19,487
Washington	85,282	79,175	6,107
Webster	64,082	42,940	21,143
West Baton Rouge	2,977	222	2,754
West Carroll	761	177	584
West Feliciana	7,556	636	6,920
Winn	192,621	141,771	50,849
All parishes	3,731,555	2,773,511	958,044

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Parishes with no pulpwood production are omitted.

Table A-6.--Round pulpwood production in Mississippi, 1986

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Adams	55,508	6,055	49,454
Alcorn	73,971	60,926	13,045
Amite	55,072	35,157	19,916
Attala	227,376	149,321	78,055
Benton	79,957	71,129	8,829
Bolivar	6	6	0
Calhoun	22,522	12,360	10,162
Carroll	49,334	25,620	23,713
Chickasaw	86,542	77,978	8,564
Choctaw	38,442	33,311	5,132
Claiborne	62,550	23,689	38,861
Clarke	136,236	53,514	82,722
Clay	29,664	24,619	5,045
Coahoma	11	0	11
Copiah	128,067	49,391	78,675
Covington	82,322	30,017	52,305
De Soto	8	0	8
Forrest	101,175	62,670	38,505
Franklin	82,360	34,259	48,101
George	54,725	25,630	29,096
Greene	138,100	80,893	57,206
Grenada	20,467	12,872	7,594
Hancock	28,995	22,312	6,683
Harrison	42,308	38,056	4,252
Hinds	48,026	19,039	28,986
Holmes	79,776	43,972	35,803
Humphreys	82	11	72
Issaquena	3,091	25	3,066
Itawamba	217,914	170,098	47,815
Jackson	65,625	44,277	21,348
Jasper	98,617	29,564	69,053
Jefferson	81,651	30,176	51,475
Jefferson Davis	43,573	28,028	15,545
Jones	91,824	35,538	56,286
Kemper	68,914	27,694	41,220
Lafayette	20,368	10,134	10,234
Lamar	58,389	46,098	12,291
Lauderdale	171,092	80,248	90,844
Lawrence	65,554	45,955	19,599
Leake	127,195	84,257	42,937

Table A-6.--Round pulpwood production in Mississippi, 1986--Continued

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Lee	39,992	32,944	7,047
Leflore	2,981	1,036	1,945
Lincoln	69,777	38,927	30,850
Lowndes	7,055	2,591	4,464
Madison	30,594	22,321	8,273
Marion	56,664	36,470	20,195
Marshall	42,512	39,488	3,024
Monroe	35,112	32,600	2,512
Montgomery	29,471	10,520	18,951
Neshoba	49,776	18,117	31,659
Newton	103,680	43,722	59,958
Noxubee	50,778	24,878	25,900
Oktibbeha	49,389	39,843	9,546
Panola	1,283	729	553
Pearl River	91,163	82,165	8,998
Perry	86,840	60,876	25,964
Pike	45,925	28,334	17,592
Pontotoc	19,897	18,489	1,408
Prentiss	132,525	90,897	41,628
Quitman	46	17	30
Rankin	129,819	77,598	52,221
Scott	91,063	65,114	25,949
Sharkey	1,078	255	822
Simpson	77,042	43,399	33,643
Smith	81,710	29,382	52,328
Stone	50,785	37,858	12,928
Sunflower	12	9	3
Tallahatchie	1,911	1,000	911
Tate	45	25	20
Tippah	122,841	108,722	14,118
Tishomingo	165,587	116,948	48,639
Tunica	45	9	36
Union	40,871	33,899	6,972
Walthall	28,559	18,869	9,691
Warren	21,194	1,179	20,015
Washington	1,104	11	1,093
Wayne	141,481	72,774	68,708
Webster	36,669	32,010	4,659
Wilkinson	59,713	25,219	34,494
Winston	63,043	43,874	19,169
Yalobusha	27,244	15,856	11,388
Yazoo	10,906	5,480	5,426
All counties	4,935,592	2,979,353	1,956,238

¹Counties with no pulpwood production are omitted.

Table A-7.--Round pulpwood production in North Carolina, 1986

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Alamance	2,537	363	2,174
Alexander	4,982	4,406	576
Alleghany	80	0	80
Anson	96,764	63,642	33,122
Beaufort	227,533	170,018	57,515
Bertie	255,920	84,613	171,307
Bladen	148,005	57,463	90,542
Brunswick	77,634	47,978	29,656
Buncombe	1,049	360	689
Burke	113,660	61,080	52,580
Cabarrus	9,497	8,937	560
Caldwell	14,289	4,019	10,270
Camden	20,434	9,268	11,166
Carteret	63,437	53,177	10,260
Caswell	4,679	9	4,670
Catawba	5,602	5,366	236
Chatham	27,976	11,862	16,114
Cherokee	14,712	12,933	1,779
Chowan	20,157	6,050	14,107
Clay	1,582	1,342	240
Cleveland	30,299	25,647	4,652
Columbus	146,553	85,172	61,381
Craven	262,399	206,127	56,272
Cumberland	80,324	36,859	43,465
Currituck	16,951	6,577	10,374
Dare	508	508	0
Davidson	4,111	3,084	1,027
Davie	1,451	1,238	213
Duplin	62,397	40,195	22,202
Durham	21,657	6,319	15,338
Edgecombe	47,589	15,822	31,767
Forsyth	5,802	2,480	3,322
Franklin	37,737	19,797	17,940
Gaston	4,932	4,766	166
Gates	52,656	23,819	28,837
Graham	73	16	57
Granville	30,786	12,995	17,791
Greene	21,200	8,914	12,286
Guilford	12,050	5,394	6,656
Halifax	123,345	69,772	53,573
Harnett	18,589	9,869	8,720
Haywood	92,783	37,224	55,559
Henderson	3,109	1,350	1,759

Table A-7.--Round pulpwood production in North Carolina, 1986 --Continued

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Hertford	43,087	18,242	24,845
Hoke	11,781	7,917	3,864
Hyde	61,328	35,880	25,448
Iredell	10,129	9,079	1,050
Jackson	240	188	52
Johnston	36,151	12,127	24,024
Jones	36,039	24,614	11,425
Lee	18,574	8,089	10,485
Lenoir	59,887	41,375	18,512
Lincoln	7,778	7,423	355
McDowell	23,948	11,364	12,584
Macon	192	0	192
Madison	2,880	417	2,463
Martin	58,078	44,081	13,997
Mecklenburg	10,724	9,263	1,461
Mitchell	2,438	45	2,393
Montgomery	35,598	14,891	20,707
Moore	51,256	31,126	20,130
Nash	28,049	11,061	16,988
New Hanover	31,166	26,298	4,868
Northampton	38,952	11,475	27,477
Onslow	78,399	70,629	7,770
Orange	7,114	1,094	6,020
Pamlico	66,497	42,543	23,954
Pasquotank	10,074	4,358	5,716
Pender	92,195	64,859	27,336
Perquimans	27,958	17,025	10,933
Person	6,935	35	6,900
Pitt	65,328	40,935	24,393
Polk	19,781	13,507	6,274
Randolph	1,601	637	964
Richmond	45,266	24,727	20,539
Robeson	89,605	56,298	33,307
Rockingham	4,807	2,698	2,109
Rowan	9,692	9,279	413
Rutherford	42,324	27,627	14,697
Sampson	90,279	60,592	29,687
Scotland	19,000	13,153	5,847
Stanly	8,113	2,712	5,401

Table A-7.--Round pulpwood production in North Carolina, 1986 --Continued

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Stokes	2,481	464	2,017
Surry	4,219	944	3,275
Swain	702	491	211
Transylvania	4,607	235	4,372
Tyrrell	8,439	7,595	844
Union	7,960	7,900	60
Vance	25,327	7,126	18,201
Wake	40,485	26,813	13,672
Warren	36,680	19,906	16,774
Washington	16,401	6,470	9,931
Wayne	28,031	10,028	18,003
Wilkes	5,931	1,094	4,837
Wilson	30,203	11,492	18,711
Yadkin	1,791	568	1,223
Yancey	817	14	803
All counties	3,655,147	2,105,633	1,549,514

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Counties with no pulpwood production are omitted.

Table A-8.--Round pulpwood production in Oklahoma, 1986

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Choctaw	13,015	4,277	8,738
Latimer	4,709	2,513	2,196
Le Flore	12,750	6,984	5,766
McCurtain	36,482	21,710	14,772
Pushmataha	37,305	20,016	17,289
All counties	104,261	55,501	48,761

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Counties with no pulpwood production are omitted.

Table A-9.--Round pulpwood production in South Carolina, 1986

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Abbeville	50,963	29,757	21,206
Aiken	32,417	14,881	17,536
Allendale	31,786	15,636	16,150
Anderson	30,510	19,898	10,612
Bamberg	17,846	5,421	12,425
Barnwell	18,019	5,856	12,163
Beaufort	41,365	34,599	6,766
Berkeley	149,703	130,389	19,314
Calhoun	15,911	6,462	9,449
Charleston	43,027	29,239	13,788
Cherokee	38,757	37,114	1,643
Chester	89,610	74,530	15,080
Chesterfield	85,168	66,254	18,914
Clarendon	38,218	21,499	16,719
Colleton	137,106	82,290	54,816
Darlington	55,529	25,065	30,464
Dillon	28,445	17,190	11,255
Dorchester	115,149	71,109	44,040
Edgefield	76,201	44,596	31,605
Fairfield	145,772	108,728	37,044
Florence	56,249	39,785	16,464
Georgetown	192,465	147,920	44,545
Greenville	26,277	18,753	7,524
Greenwood	68,280	38,397	29,883
Hampton	90,753	51,339	39,414
Horry	118,549	81,921	36,628
Jasper	110,691	68,684	42,007
Kershaw	130,373	102,877	27,496
Lancaster	97,588	70,484	27,104
Laurens	95,201	65,411	29,790
Lee	13,788	10,193	3,595
Lexington	27,107	13,669	13,438
McCormick	80,311	58,910	21,401

Table A-9.--Round pulpwood production in South Carolina, 1986--Continued

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Marion	48,212	19,749	28,463
Marlboro	50,068	24,259	25,809
Newberry	174,592	127,464	47,128
Oconee	13,968	11,620	2,348
Orangeburg	79,761	28,951	50,810
Pickens	38,733	25,345	13,388
Richland	61,737	39,215	22,522
Saluda	53,735	26,149	27,586
Spartanburg	43,954	37,539	6,415
Sumter	69,225	43,606	25,619
Union	59,616	50,256	9,360
Williamsburg	112,070	77,240	34,830
York	56,892	55,257	1,635
All counties	3,211,697	2,175,506	1,036,191

1

Counties with no pulpwood production are omitted.

Table A-10.--Round pulpwood production in Tennessee, 1986

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Anderson	9,732	9,732	0
Benton	26,900	9,953	16,947
Bledsoe	27,687	9,315	18,372
Blount	16,228	15,793	435
Bradley	46,564	46,102	463
Carroll	5,731	1,753	3,978
Carter	8,294	0	8,294
Chester	3,744	2,945	799
Claiborne	99	99	0
Clay	1,265	0	1,265
Cocke	7,819	4,200	3,619
Coffee	3,465	3,465	0
Cumberland	13,170	12,752	418

Table A-10.--Round pulpwood production in Tennessee, 1986--Continued

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Decatur	37,798	17,534	20,264
Fayette	407	407	0
Fentress	8,926	8,926	0
Franklin	7,687	0	7,687
Giles	2,644	2,360	284
Grainger	3,102	1,356	1,746
Greene	1,702	1,060	643
Grundy	28,091	7,880	20,212
Hamblen	9,914	9,434	480
Hamilton	24,296	19,093	5,203
Hancock	6,712	1,049	5,664
Hardeman	8,163	5,041	3,121
Hardin	102,463	89,066	13,396
Hawkins	10,256	0	10,256
Haywood	43	43	0
Henderson	3,776	3,776	0
Henry	4,821	1,675	3,147
Hickman	54,069	19,029	35,040
Houston	1,732	1,652	79
Humphreys	39,286	505	38,781
Jackson	5,850	5,850	0
Jefferson	1,269	1,269	0
Johnson	2,323	0	2,323
Knox	3,028	3,028	0
Lawrence	23,969	14,495	9,474
Lewis	9,227	4,779	4,448
Loudon	10,782	10,545	237
McMinn	39,915	39,161	754
McNairy	74,911	61,431	13,480
Madison	18,008	17,689	320
Marion	25,931	12,161	13,770
Marshall	51	51	0
Maury	1,074	1,074	0
Meigs	24,764	24,186	578
Monroe	29,827	29,633	195
Montgomery	1,142	1,142	0
Morgan	11,768	11,734	34
Overton	3,500	3,500	0
Perry	23,262	23,226	36
Polk	43,357	42,907	450
Putnam	11,194	11,194	0

Table A-10.--Round pulpwood production in Tennessee, 1986--Continued

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Rhea	41,036	40,678	358
Roane	20,498	20,232	266
Scott	16,287	15,447	839
Sequatchie	11,477	11,331	146
Sevier	1,071	1,071	0
Shelby	6,832	2,457	4,375
Stewart	30,572	20,131	10,440
Sullivan	4,020	0	4,020
Unicoi	1,988	192	1,796
Van Buren	3,389	2,039	1,350
Warren	2,039	2,039	0
Washington	500	18	482
Wayne	191,862	45,825	146,037
Weakley	1,693	148	1,544
White	2,830	2,289	540
All counties	1,227,831	788,945	438,885

1

Counties with no pulpwood production are omitted.

Table A-11.--Round pulpwood production in Texas, 1986

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Anderson	4,070	2,190	1,881
Angelina	56,494	49,625	6,870
Bowie	40,545	24,066	16,478
Camp	10,432	7,841	2,591
Cass	219,557	134,758	84,798
Chambers	362	362	0
Cherokee	49,433	46,213	3,220
Gregg	2,717	1,572	1,144
Grimes	1,015	0	1,015
Hardin	125,218	88,085	37,133
Harris	2,106	11	2,095

Table A-11.--Round pulpwood production in Texas, 1986 --Continued

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Harrison	91,315	51,763	39,552
Henderson	21	0	21
Houston	35,936	19,632	16,304
Jasper	164,366	97,711	66,655
Jefferson	7,483	4,018	3,465
Liberty	32,448	12,995	19,453
Llano	472	419	53
Marion	86,455	56,719	29,735
Montgomery	7,567	139	7,428
Morris	40,223	22,391	17,831
Nacogdoches	37,162	33,942	3,221
Newton	153,132	114,503	38,629
Orange	28,675	20,589	8,086
Panola	71,716	52,447	19,269
Polk	279,449	226,549	52,901
Red River	997	589	408
Rusk	47,931	28,973	18,958
Sabine	29,058	12,700	16,358
San Augustine	31,844	6,873	24,971
San Jacinto	87,514	73,772	13,742
Shelby	41,009	27,835	13,174
Smith	10,060	4,035	6,025
Titus	11,188	7,212	3,976
Trinity	173,531	170,146	3,385
Tyler	50,165	25,780	24,385
Upshur	19,964	12,805	7,159
Walker	18,567	4,732	13,835
All counties	2,070,196	1,443,992	626,204

1

Counties with no pulpwood production are omitted.

Table A-12.--Round pulpwood production in Virginia, 1986

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Accomack	15,163	15,163	0
Albemarle	59,834	16,446	43,388
Alleghany	47,629	8,795	38,834
Amelia	32,777	18,434	14,343
Amherst	26,972	12,296	14,676
Appomattox	47,678	33,066	14,612
Augusta	17,480	3,785	13,695
Bath	52,175	4,918	47,257
Bedford	99,055	22,850	76,205
Bland	6,638	544	6,094
Botetourt	57,699	8,081	49,618
Brunswick	68,114	41,296	26,818
Buchanan	2,419	0	2,419
Buckingham	198,653	98,283	100,370
Campbell	86,452	34,334	52,118
Caroline	35,318	23,128	12,190
Carroll	752	191	561
Charles City	18,194	13,975	4,219
Charlotte	71,086	46,969	24,117
Chesapeake	3,497	934	2,563
Chesterfield	11,071	6,248	4,823
Craig	20,167	4,100	16,067
Culpeper	14,793	9,645	5,148
Cumberland	53,134	27,867	25,267
Dinwiddie	39,568	15,381	24,187
Essex	22,891	15,611	7,280
Fairfax	1,775	937	838
Fauquier	16,919	10,390	6,529
Floyd	74	0	74
Fluvanna	32,514	18,932	13,582
Franklin	116,433	34,673	81,760
Frederick	7,120	4,706	2,414
Giles	22	0	22
Gloucester	22,247	16,838	5,409
Goochland	19,842	16,572	3,270
Greensville	33,512	11,091	22,421
Halifax	59,758	26,611	33,147
Hanover	16,521	14,360	2,161
Henrico	4,145	2,244	1,901
Henry	25,416	5,287	20,129
Highland	22,071	2,346	19,725

Table A-12.--Round pulpwood production in Virginia, 1986 --Continued

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Isle of Wight	24,785	5,781	19,004
James City	2,106	846	1,260
King and Queen	54,513	36,908	17,605
King George	2,485	2,160	325
King William	21,203	15,803	5,400
Lancaster	8,606	6,227	2,379
Lee	17,321	0	17,321
Loudoun	497	454	43
Louisa	20,640	18,366	2,274
Lunenburg	23,796	8,531	15,265
Madison	850	733	117
Mathews	1,895	1,380	515
Mecklenburg	49,451	31,993	17,458
Middlesex	10,333	5,738	4,595
Nelson	64,414	19,664	44,750
New Kent	24,006	15,867	8,139
Newport News	90	56	34
Northampton	3,564	1,411	2,153
Northumberland	8,008	3,457	4,551
Nottoway	23,141	14,699	8,442
Orange	50,552	32,905	17,647
Page	105	99	6
Patrick	265	7	258
Pittsylvania	111,665	43,863	67,802
Powhatan	18,133	12,330	5,803
Prince Edward	42,388	25,143	17,245
Prince George	11,081	5,495	5,586
Prince William	3,109	2,172	937
Pulaski	711	78	633
Rappahannock	1,859	1,472	387
Richmond	12,859	10,633	2,226
Roanoke	409	326	83
Rockbridge	63,280	12,556	50,724
Rockingham	1,265	540	725
Russell	2,461	0	2,461

Table A-12.--Round pulpwood production in Virginia, 1986 --Continued

1 County	All species	Softwood	Hardwood
-----Standard cords-----			
Scott	29,019	0	29,019
Shenandoah	3,129	1,718	1,411
Smyth	5,158	0	5,158
Southampton	74,549	14,330	60,219
Spotsylvania	43,220	37,016	6,204
Stafford	7,103	6,050	1,053
Suffolk	24,345	9,088	15,257
Surry	21,033	5,784	15,249
Sussex	32,389	9,438	22,951
Tazewell	7	0	7
Virginia Beach	1,499	1,132	367
Warren	1,701	567	1,134
Washington	2,332	0	2,332
Westmoreland	6,574	4,906	1,668
Wise	10,682	0	10,682
Wythe	962	0	962
York	1,899	997	902
All counties	2,435,025	1,076,046	1,358,979

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Counties with no pulpwood production are omitted.

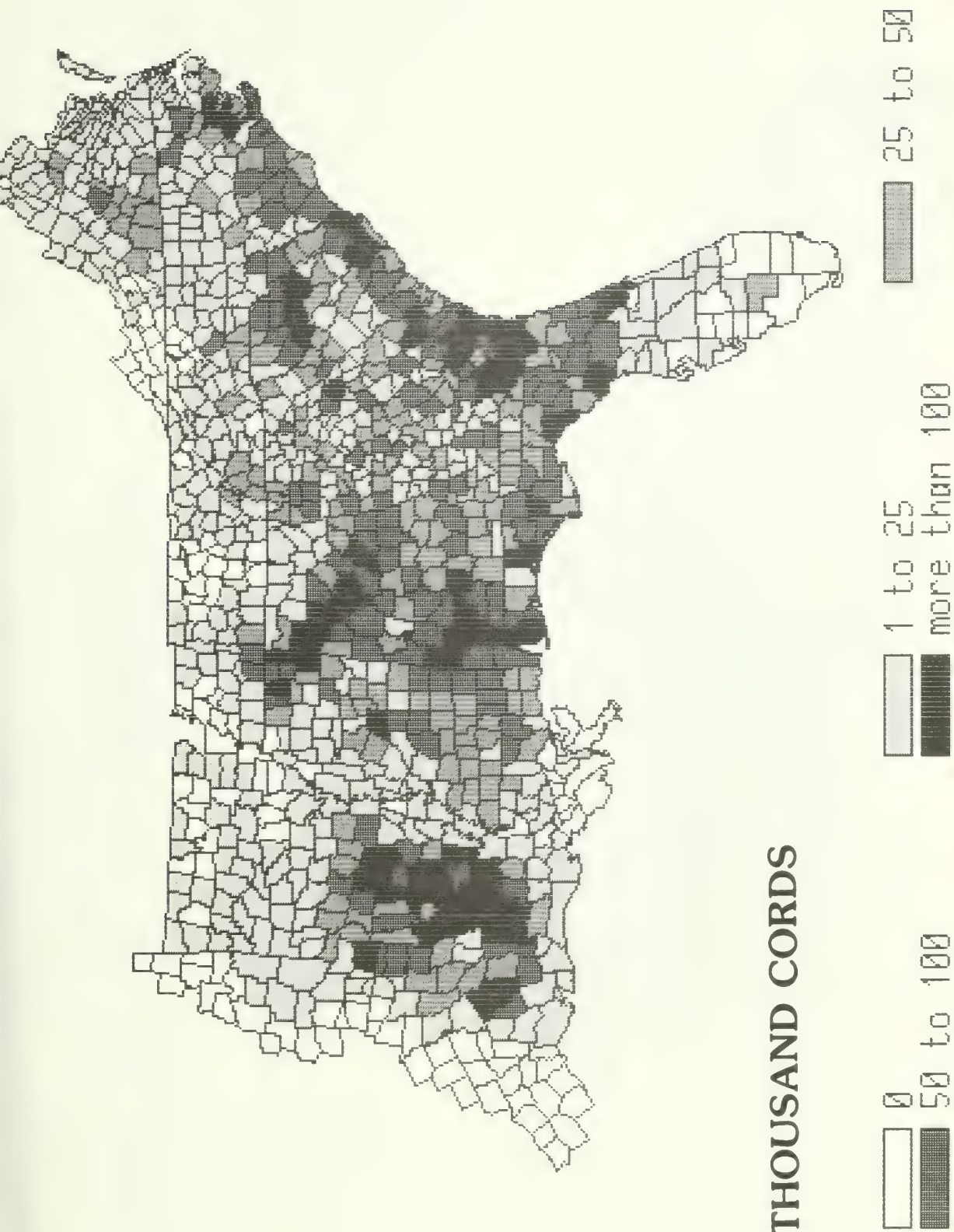


Figure A-1.--1986 softwood roundwood production by county.

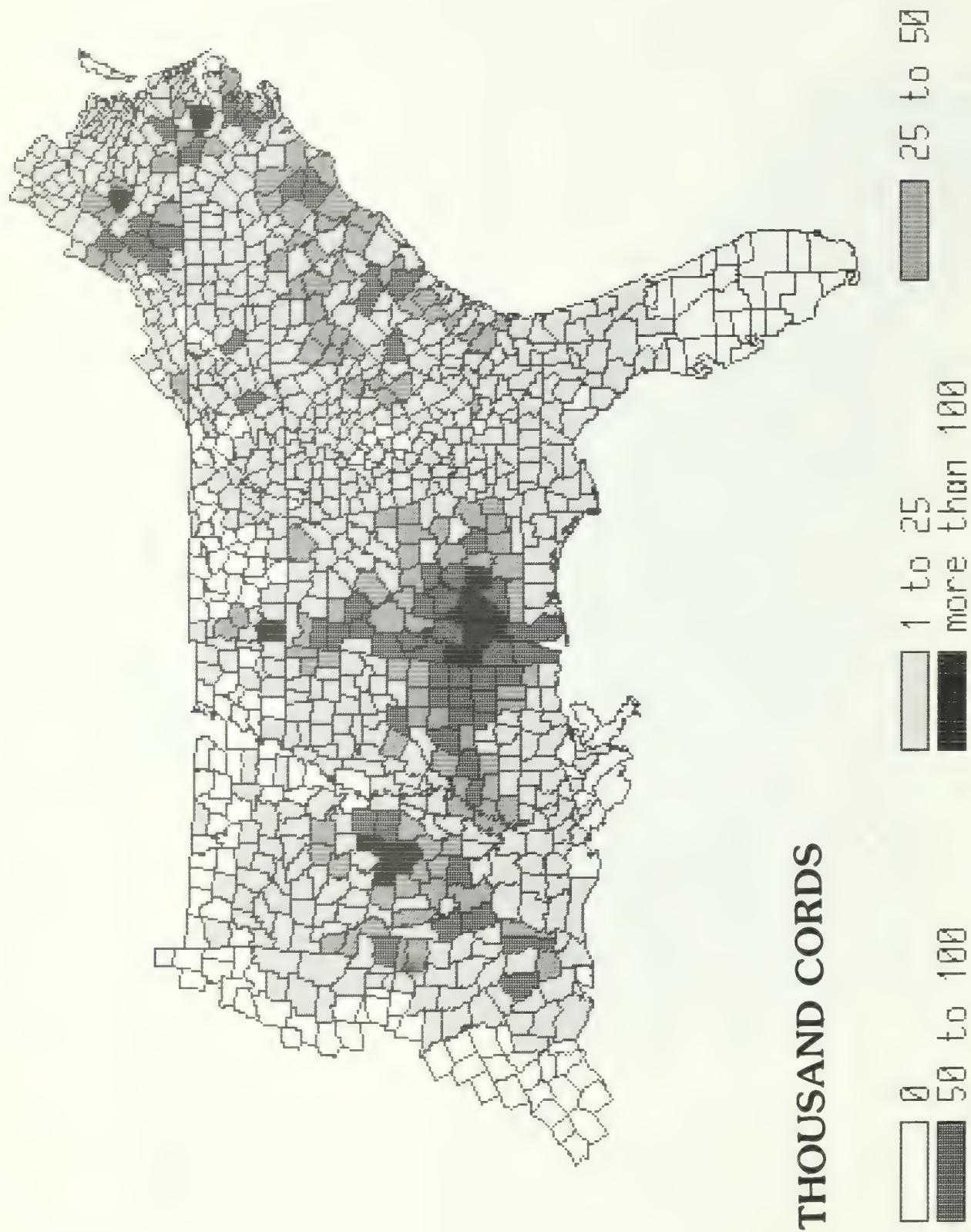


Figure A-2.--1986 hardwood roundwood production by county.

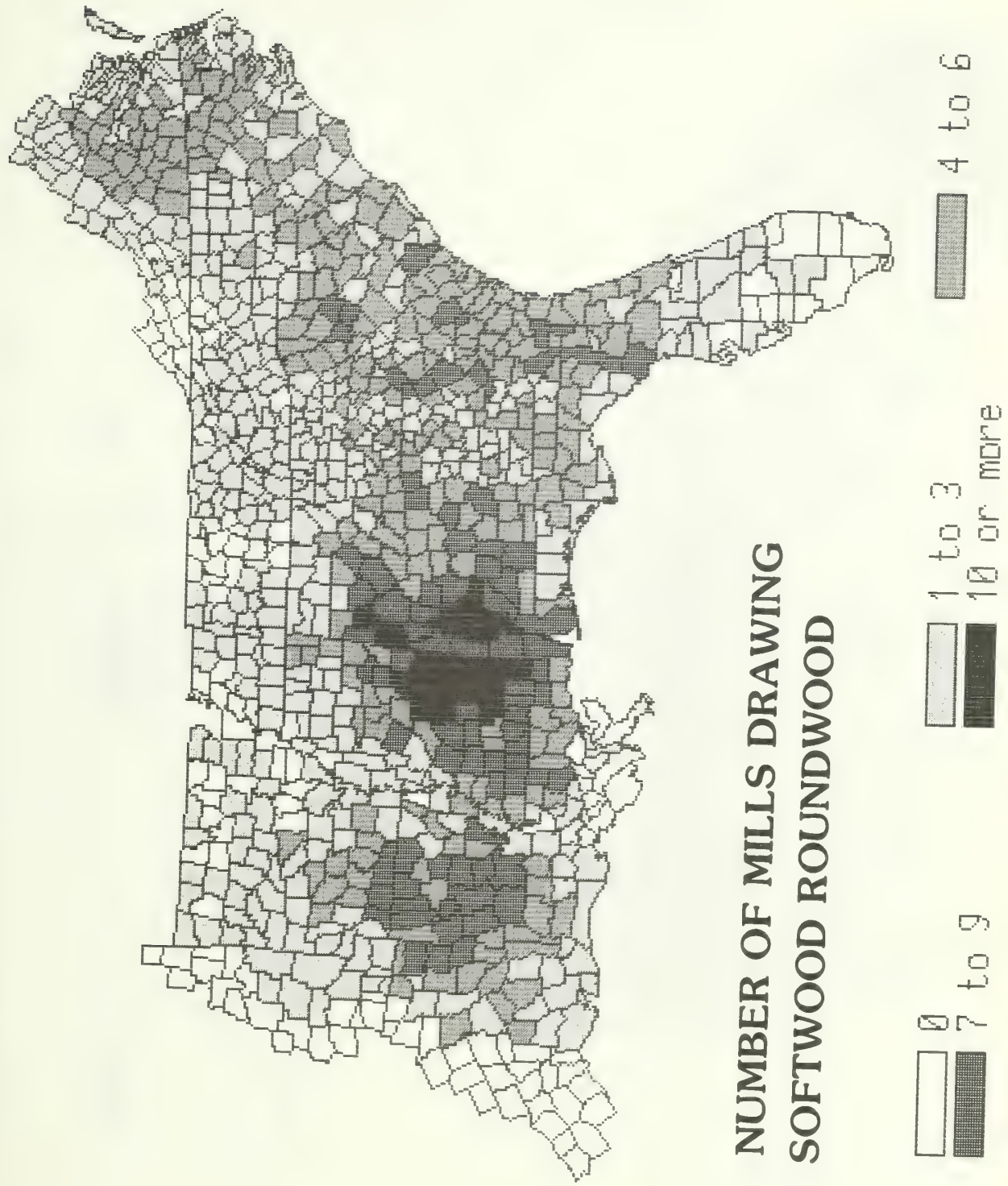


Figure A-3.--1986 competition among mills for softwood roundwood.

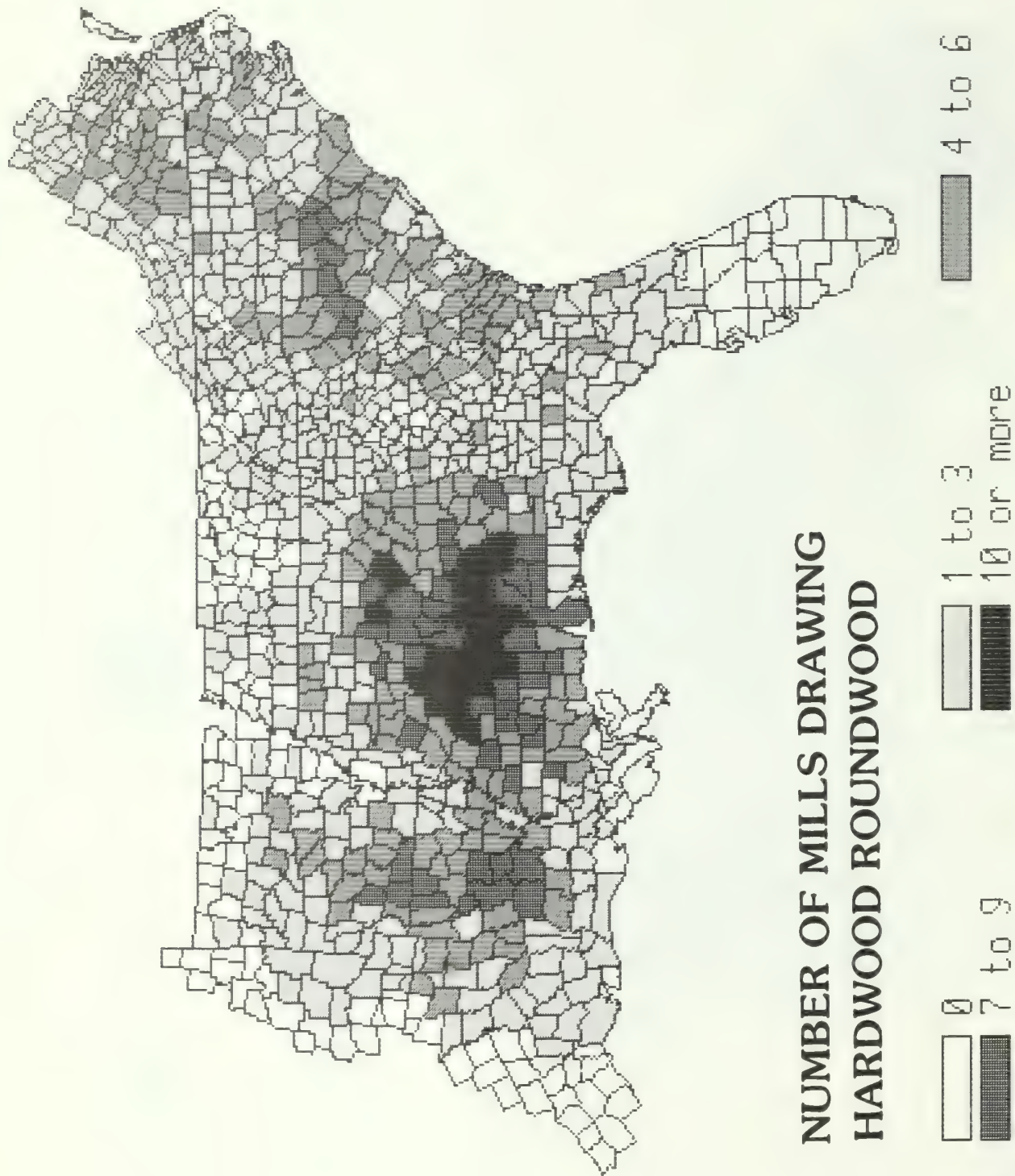


Figure A-4.--1986 competition among mills for hardwood roundwood.

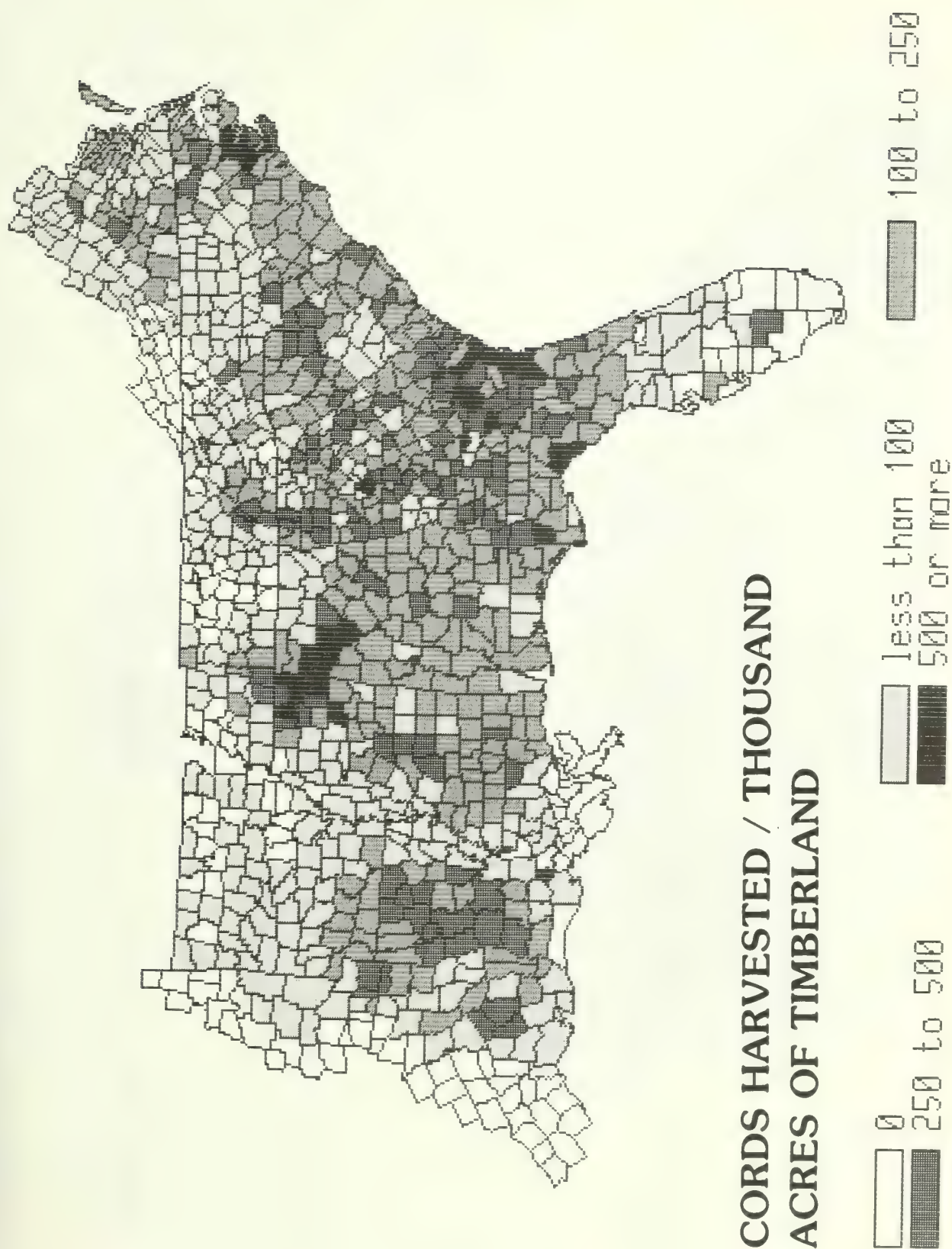
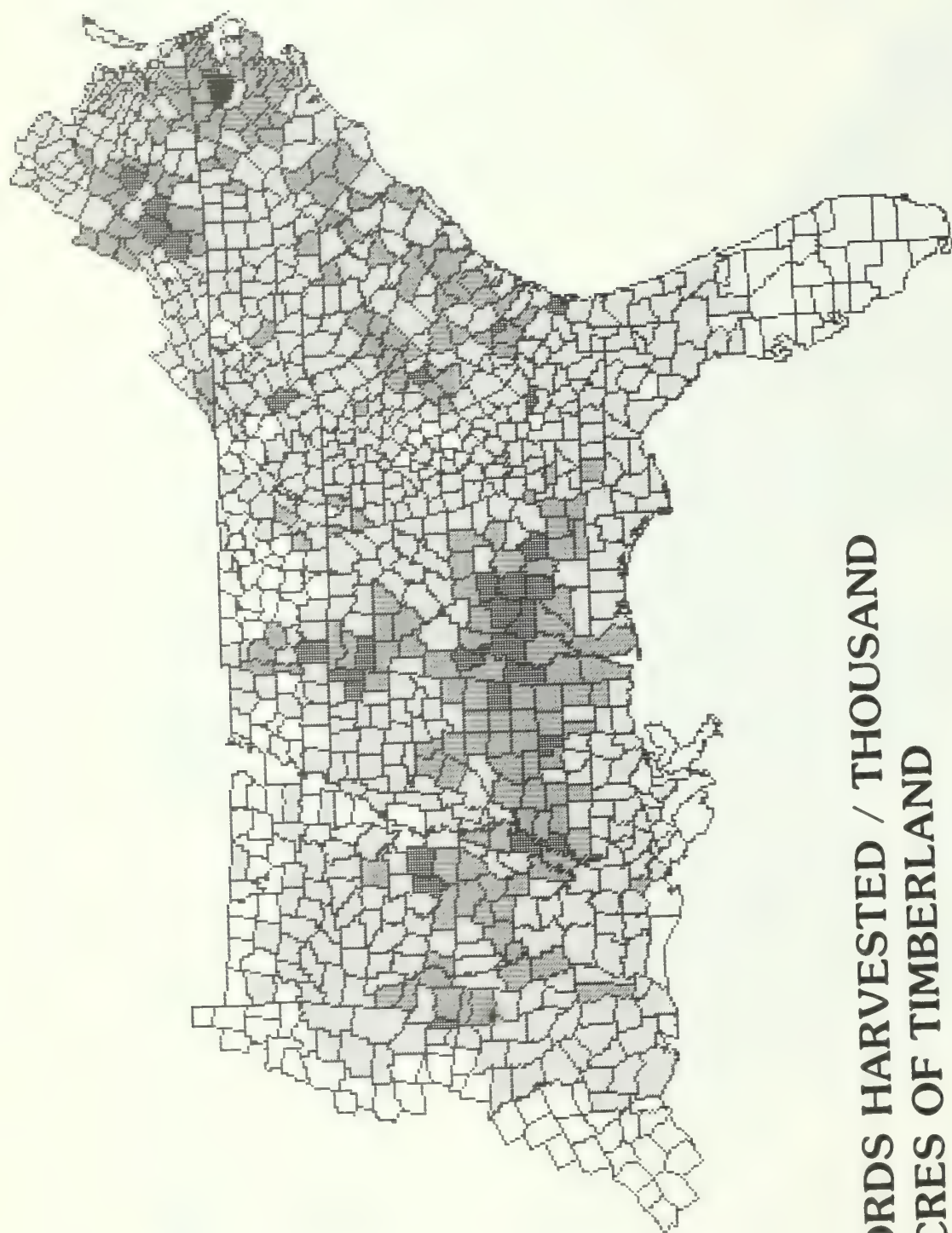


Figure A-5.--1986 softwood roundwood harvesting intensity.



CORDS HARVESTED / THOUSAND ACRES OF TIMBERLAND

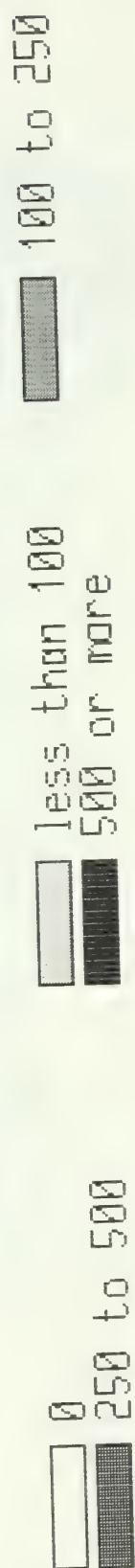


Figure A-6.--1986 hardwood roundwood harvesting intensity.

May, Dennis M. Southern pulpwood production, 1986. Resour. Bull. SO-138. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station, 1988. 40 p.

In 1986, Southern pulpwood production increased 6 percent, to 60.6 million cords; roundwood production increased 9 percent, to 40.4 million cords; and wood residue production increased 2 percent, to 20.1 million cords. Since 1977, roundwood production has been increasing while wood residue production has leveled off. Hardwoods have been capturing a larger proportion of the total pulpwood production since 1977. Pulping capacity of the 105 pulpmills operating in 1986 totaled 119,825 tons per day.

Additional key words: pulpmills, roundwood, wood residues.





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Nontimber Values of East Texas Timberland

Victor A. Rudis



Front Cover

East Texas timberland is described in terms of (A) water and soils, (B) range or livestock use, (C) wildlife habitat, and (D) recreation.

The results presented in this report provide information about East Texas' forest resource in terms of nontimber values. Data were gathered while surveying timberland for regional forest management and planning. Further evaluation and critical assessment at appropriate levels of aggregation is encouraged. More detailed information is available at cost and through cooperative agreements with research institutions. Address inquiries to: Project Leader, Forest Inventory and Analysis Unit, Southern Forest Experiment Station, P.O. Box 906, 201 Lincoln Green, Starkville, MS 39759.

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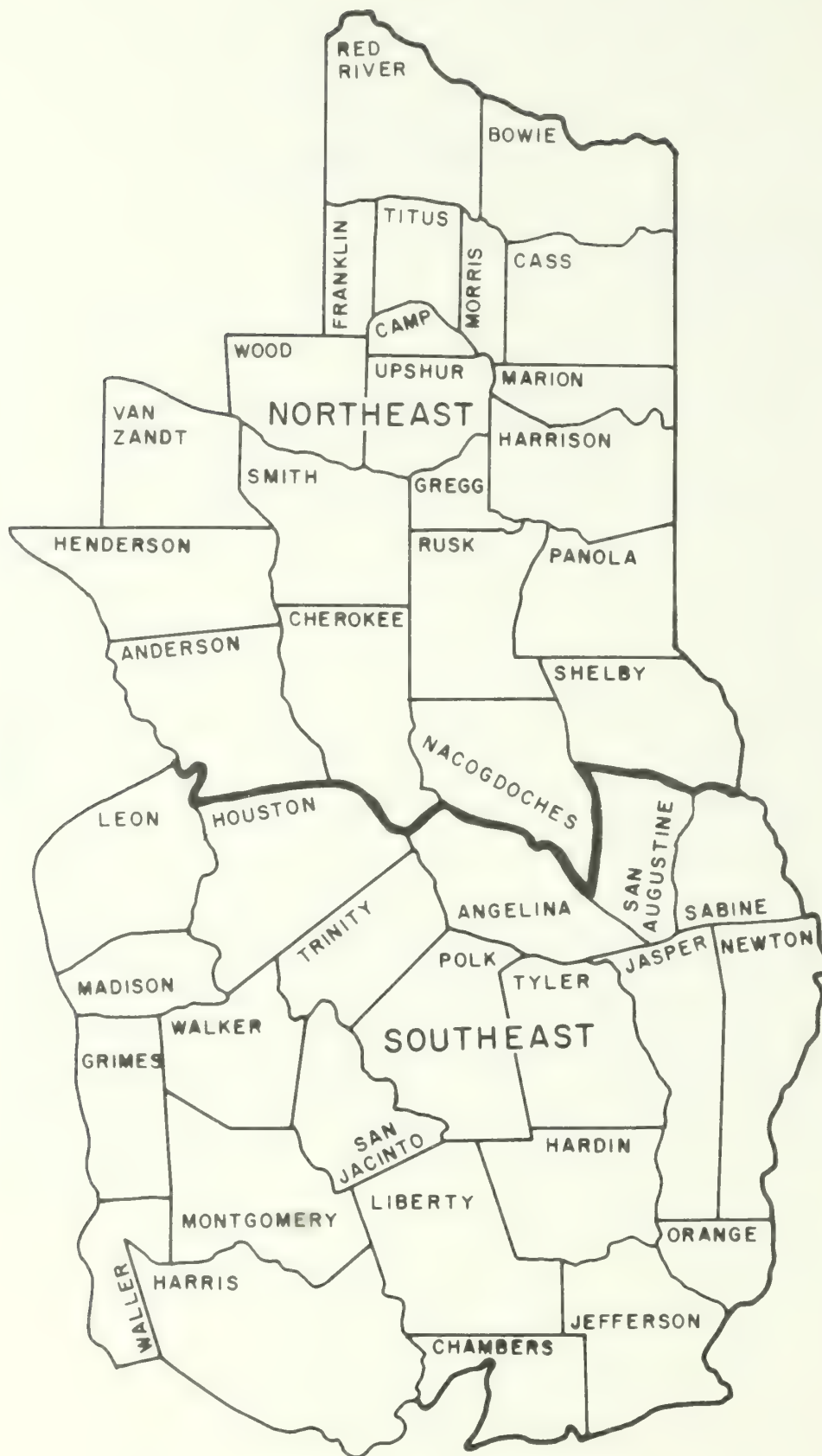


Figure 1.— The forest survey regions of East Texas.

Nontimber Values of East Texas Timberland

Victor A. Rudis

HIGHLIGHTS

As a companion to the East Texas timber report (McWilliams and Lord 1988), this document presents information about the other forest values associated with timberland. These "nontimber" values include water, soils, range, wildlife, and recreation. Data are presented to provide information for assessing the geographic distribution and relative scarcity of these nontimber values. Data also can serve as a benchmark for future assessment of trends. Attributes include frequency of occurrence data by population planning districts, slope class, presence of vegetative debris, evidence of livestock use, fire, garbage dumping and littering, and proximity of timberland to water bodies, urban areas, agricultural areas, and roads. Briefly presented or referenced are secondary data sources (information collected by other agencies) associated with timberland. Highlights are as follows:

- A third of the timberland area is within 1,600 feet of permanent water sources (water bodies $\frac{1}{8}$ acre or larger or water courses 40 feet or more in width); 18 percent is within 800 feet of water sources.
- Timberland with greater than 15 percent slope and within 1,600 feet of water sources represents 116,500 acres (138 million cubic feet of growing-stock volume), 1 percent of the total in the region.
- Timberland with evidence of livestock use occurs on 23 percent of the acreage, mostly in the survey region's western counties that represent transition areas between forest and rangeland.
- Potential red-cockaded woodpecker nesting habitat on timberland is scarce. Estimates vary with assumptions, but range from 84,100 acres to 545,600. Between $\frac{1}{4}$ and $\frac{1}{2}$ of the potential nesting habitat occurs on public timberland.
- Timberland acreage has declined by less than 1 percent. In pine forest types, shifts have occurred toward sapling and seedling stands and loblolly pine over shortleaf pine. In hardwood forest types, shifts have occurred toward

oak-pine sapling and seedling stands and oak-hickory forest type in all stand size classes. Acreage by forest ownership has changed little. Shifts in private timberland have been toward younger-aged sapling and seedling stands.

- Snags and large diameter live trees are relatively uncommon in pine forests and on forest industry lands. Most large diameter snags, large diameter live trees, and mast trees occur in bottomlands or oak-hickory forests.
- Physical access to timberland is good, as 86 percent of the acreage is within $\frac{1}{4}$ mile of roads. Remote timberland $\frac{1}{2}$ mile or more from roads and as part of forest tracts 2,500 acres or larger represents 4 percent of the acreage.
- Adjacent land uses influence and are influenced by timber utilization. Nearly 13.5 percent of the region's acreage (14.6 percent of the growing-stock volume) is within 1,200 feet of roads and within one mile of urban or built-up land. Approximately 16.7 percent of the region's acreage (11.6 percent of the growing-stock volume) is within 200 feet of agricultural land.

INTRODUCTION

This Bulletin provides an overview of the fifth survey of East Texas forest resources. Information about the nontimber values (watershed maintenance, soil retention, range potential for livestock, wildlife habitat, and recreation opportunities) is presented. A companion report, Resource Bulletin SO-136 (McWilliams and Lord 1988), discusses the forest resource in terms of timber values. Data summaries by county are provided in Resource Bulletin SO-118 (Lang and Bertelson 1987). Earlier surveys were conducted in 1935, 1935-55, 1965, and 1975 (see McWilliams and Lord 1988). Comparisons between 1975 (Murphy 1976) and 1986 take into account the slight change of counties surveyed.

Timberland's value is more than just the sum of so many cubic feet of wood. While wood production helps the region's economy, other values of timberland contribute to the economy as well.

Forest management and planning that considers only timber values has hidden costs in terms of other values foregone. Management to retain nontimber values also may reduce the economic efficiency of timber management. Wise stewardship of timberland ultimately depends upon all forest values—no one value can be emphasized without impacting the others.

Timberland managed for marketable values in addition to timber (e.g., livestock or hunting leases) can have fewer financial risks, particularly when wood prices are unstable, and can supplement income between timber harvests. Nonmarket values of timberland (e.g., maintenance of water supplies and water quality, aesthetics) are important to the tourism industry, enhance the standard-of-living of local communities, and help attract industries not dependent on wood production, particularly those in the service sector.

Some of the “other forest values,” or nontimber values, of timberland include watershed maintenance, soil retention, range (livestock) potential, game and nongame wildlife habitat, and opportunities for dispersed recreation. In East Texas, as elsewhere in the United States, other forest values depend upon characteristics of forested land, its adjacent and nearby land uses, and distance from population centers. Some forests help maintain water quality, others are used for livestock grazing, and still others provide habitat for rare and endangered wildlife. Many forests are valuable for hunting and other outdoor recreation activities, but some are more distant from users, inaccessible by roads, or otherwise restricted from public use. The interplay of forest land with other land uses and timber management practices produces a regional pattern of land development that varies uniquely from county to county.

These “other forest values” are examined where possible in terms of physical, geographic, and socioeconomic attributes. Also given are the more traditional estimates of area, volume, and stand structure characteristics of timberland. Definitions of terms used in the text, estimates of statistical reliability, a species list, species occurrence data, and estimates of relative importance are tabulated in the Appendix. A brief portion of the data and analyses from other agencies are presented to assist in this examination. Readers are urged to seek further details about particular values by direct examination of the referenced reports or by contacting the Texas agencies charged with responsibility for assessing the other values and land areas in the State.

BACKGROUND

This report focuses on the nontimber values of East Texas timberland as recorded in field surveys between April 1985 and February 1986. Earlier surveys, originally mandated by the McSweeney-McNary Act of 1928, provided basic periodic assessments of public and private forest resources—mainly in terms of timber values. More recent legislation, the Forest and Rangeland Renewable Resources Planning Act of 1974 and the Forest and Rangeland Renewable Resources Research Act of 1978, mandated that the Forest service make and keep current comprehensive assessments of forested areas, thereby broadening the survey to consider nontimber values.

Data in this report apply to the 43 counties comprising the Southeast and Northeast forest survey regions (fig. 1). Permanent sample field plots are distributed systematically throughout East Texas on a virtual 3-mile grid. Of the 3,761 plots, 1,910 are classified as timberland and sampled for detailed tree- and plot-level information. Approximate timberland plot locations are shown in figure 2.

The total land base for the 43 counties is 21,593,700 acres. Of this, 9,794,200 acres are classified as agriculture, urban, residential, highways and other rights-of-way, and small wooded lots or strips too small to meet the classification of timberland. The remaining 11,799,500 acres are forested, with 119,700 acres classed as productive reserved and 114,500 classed as unproductive. This leaves 11,565,300 acres classed as timberland.

WATER AND SOILS

Enhancement of water supplies is an important role of timberland. Stands with adequate vegetative cover intercept most of the precipitation that otherwise would cause soil erosion, stream siltation, and downstream flooding. Such stands help retain soil and recharge underground water supplies. Conversion of timberland to cropland and urban uses not only increases water yield through added surface runoff but also increases soil erosion and the potential for downstream flooding that ultimately reduce water quality.

Important benefits to sport fishing and reduced logging road maintenance costs can accrue to timberland owners while protecting water quality values (Dissmeyer and Foster 1987). Timber management practices that limit water pollution—such as proper placement of roads and skidding operations, retaining riparian areas in clearcuts, and remedial treatments after harvest (Jackson and

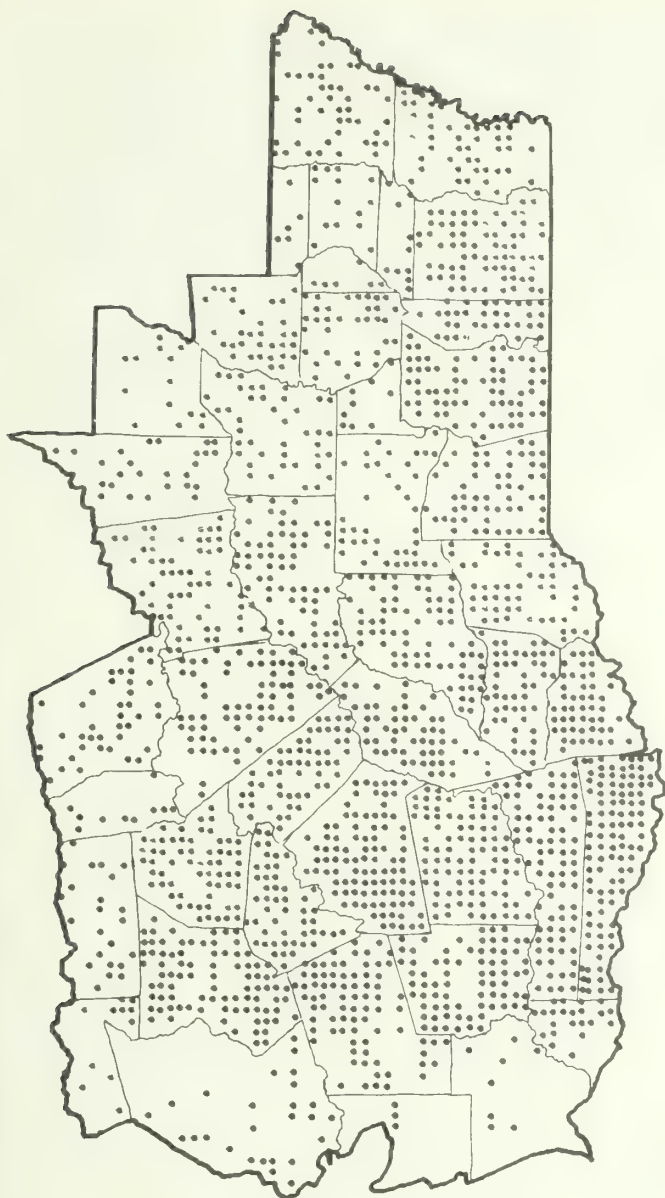


Figure 2.—Distribution of plots classified as timberland, East Texas, 1986.

others 1981)—may be needed to maintain water quality values. Restricting the amount and size of harvests in a given year and a given watershed also may benefit water values by reducing negative regional impacts.

Effects of timber harvesting on water quality are believed to be highest near water with steep slopes or with erodable soils. A third of East Texas timberland is within 1,600 feet of permanent water sources¹; 18 percent is within 800 feet of

¹All water sources—permanent and temporary—are important to the maintenance of water quality values in or near timberland. But limitations on what can be detected readily from feasible photography reduces this discussion to “permanent water sources” defined as water bodies $\frac{1}{4}$ acre or larger or water courses 40 feet or more in width.

water sources. Forests near permanent water are widely distributed (fig. 3). Rolling or hilly terrain associated with East Texas timberland is common in the northeastern portion in and around Cass County and in scattered locations in the central portion (fig. 4). Timberland with slopes greater than 15 percent accounts for 387,000 acres, 3 percent of the region’s total timberland (table 1).

Construction of logging roads in these areas may be more difficult without adversely affecting other forest values. Some of this acreage is not managed for timber, as water quality values and

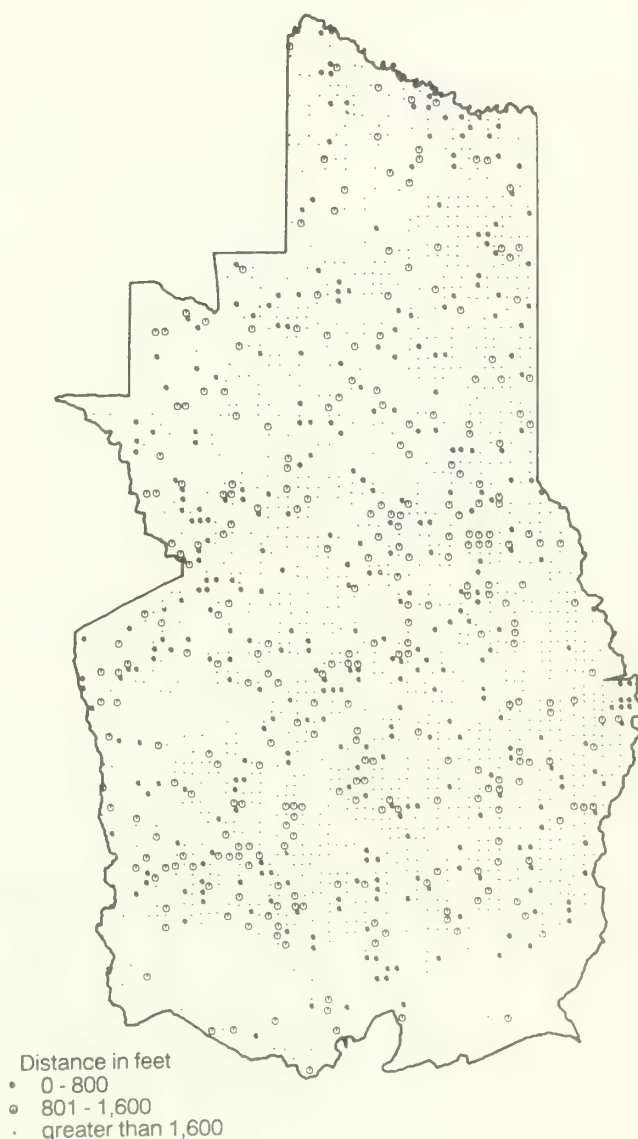


Figure 3.—Timberland by distance from permanent water sources, East Texas, 1986.

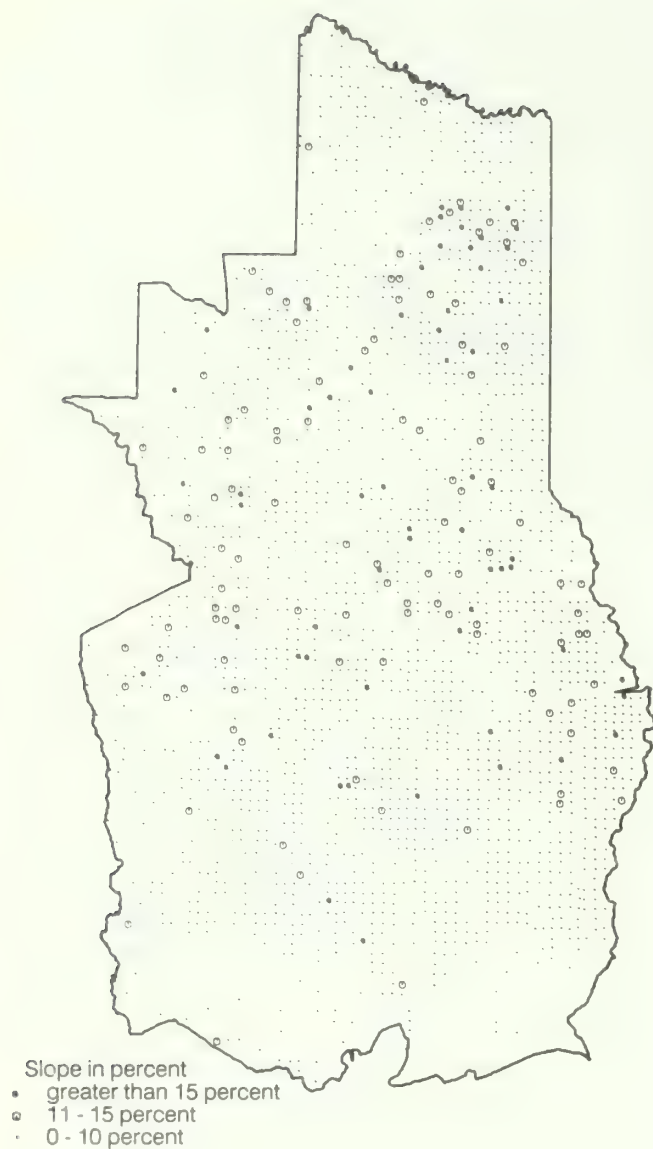


Figure 4.— Timberland by percent slope, East Texas, 1986.

associated recreation uses may preclude harvesting. (Such areas are nevertheless classified as "timberland" as there are no statutes excluding timber production.) Timberland areas with greater than 15 percent slope and within 1,600 feet of permanent water sources represent 116,500 acres (138 million cubic feet of growing-stock volume) or about 1 percent of the region's total. Most of the areas with steep slopes are found alongside lakes and ridges of river valley floodplains.

Major soil groups, or land resource areas, are shown in figure 5. East Texas timberland is dominated by Coastal Plain soils consisting of sandy loams and sand with subsoils of finer texture. In forested areas, erosion rates are greatest in the Coastal Plain (0.46 tons/acre/year), and somewhat less in the Flatwoods (0.32), Claypan Area (0.28), and Blackland Prairie (0.24). The few forests along streams of the Gulf Coast Prairie and Saline Prairie have limited erosion potential (0.05 tons/acre/year) (Greiner 1982).

Because Coastal Plain soils have moderate erosion potential, they are more suited to continuous vegetative cover, such as timberland than cropland. Erosion on cropland can be more than 10 times the rate for timberland. Erosion potential is somewhat greater for the ridges that separate the Neches and Sabine River Basin, and somewhat less in the flat areas. Pine and oak-pine are the dominant forest types, while remaining land resource areas are dominated by oak-hickory in savannahs (grassy areas with scattered trees) and bottomland hardwoods along streams and rivers. In the Claypan Area, much of the timberland is leased for hunting or used in livestock production (Godfrey and others, no date). The Blackland Prairie and Gulf Coast Prairie are used mainly for crop and livestock production or for urban development (Greiner 1982). Much of the Gulf Coast Marsh is used for wildlife needs (as a refuge, management area, or leased for hunting).

Table 1—Area of timberland by slope class and distance from water bodies, East Texas, 1986¹

Slope class	Total area	Distance from water bodies (feet)				
		over 1,600	1,201-1,600	801-1,200	401-800	0-400
<i>Percent</i>		<i>Thousand acres</i>				
0-5	8,617.7	5,670.8	649.1	661.4	806.6	829.7
6-10	1,920.9	1,418.6	150.5	107.1	133.5	111.2
11-15	640.1	428.2	44.7	56.4	47.5	63.2
16 or over	386.7	270.2	39.5	...	19.8	57.2
Total	11,565.3	7,787.9	883.8	824.9	1,007.4	1,061.3

¹Rows and columns may not sum to totals due to rounding.

RANGE

Farmers traditionally have used forests as grazing areas and seasonal shelter for livestock. Growing trees for wood products and raising livestock in combination offers potentially more income per acre, and can help stabilize periodic income by providing more market production options (Mosher 1984). Occasional use of timberland by livestock benefits older stands by reducing understory competition and providing fertilizer. In areas where herbicide use is not cost-effective, or where environmental objectives outweigh their use, livestock may be a feasible alternative for controlling competing vegetation in pine plantations (Doescher and others 1987).

Combining grazing with timber harvests, forage production, and other management practices such as prescribed fires requires careful scheduling to permit adequate regeneration. Forest grazing damages trees and compacts the soil, thereby limiting water percolation, increasing surface runoff, and reducing downstream water quality. However, such damage may be restricted only to areas that are heavily grazed (Patric and Helvey 1986). Where game production is important, competition for forage limits livestock grazing potential. Guidelines for managing southern pine forests for livestock and timber production are available (Byrd and others 1984).

In East Texas, timberland with evidence of livestock use represents 23 percent of the acreage (19 percent of the growing-stock volume) (table 2). Acreage with livestock evidence varies more by location than by forest type. Much livestock grazing on timberland occurs in the transition counties between the region's forests and rangelands (fig. 6). The potential for timber and livestock production is greatest in this area and in portions

of other counties where markets for livestock production are important. If landowners are to consider wood production as a land management option in this area, multiple use management that allows for continued grazing of livestock may be needed.

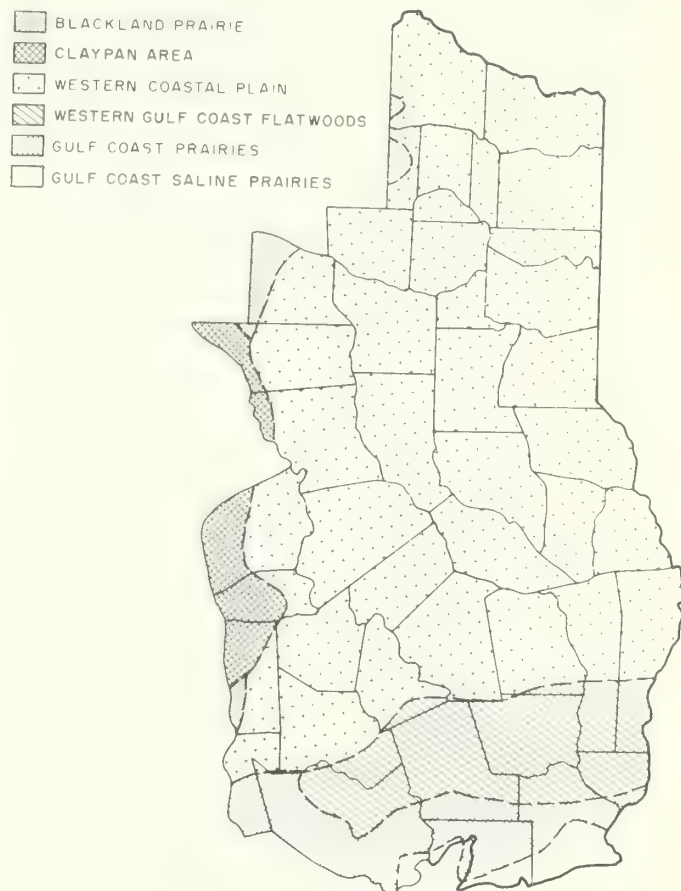


Figure 5.—Major Land Resource Areas of East Texas (Greiner 1982).

Table 2—Area and growing-stock volume of timberland with evidence of livestock use, East Texas, 1986¹

Forest type	Area			Volume		
	Total with livestock evidence			Total with livestock evidence		
	--- Thousand acres ---	Percent		Million cubic feet	Percent	
Longleaf-slash	279.9	41	15	331.6	59.7	18
Loblolly-shortleaf	3,936.6	672	17	6,104.1	981.9	16
Oak-pine	2,401.8	476	20	2,454.7	432.7	18
Oak-hickory	3,369.3	1,055	31	2,025.5	579.0	29
Bottomland hardwoods ²	1,577.7	391	25	1,530.7	263.1	17
Total	11,565.3	2,635	23	12,446.7	2,316.4	19

¹Rows and columns may not sum to totals due to rounding. Evidence includes livestock sighted (20 percent), dung (44 percent), tracks (15 percent), trails (4 percent), and other artifacts (17 percent).

²Includes oak-gum-cypress and elm-ash-cottonwood forest types.

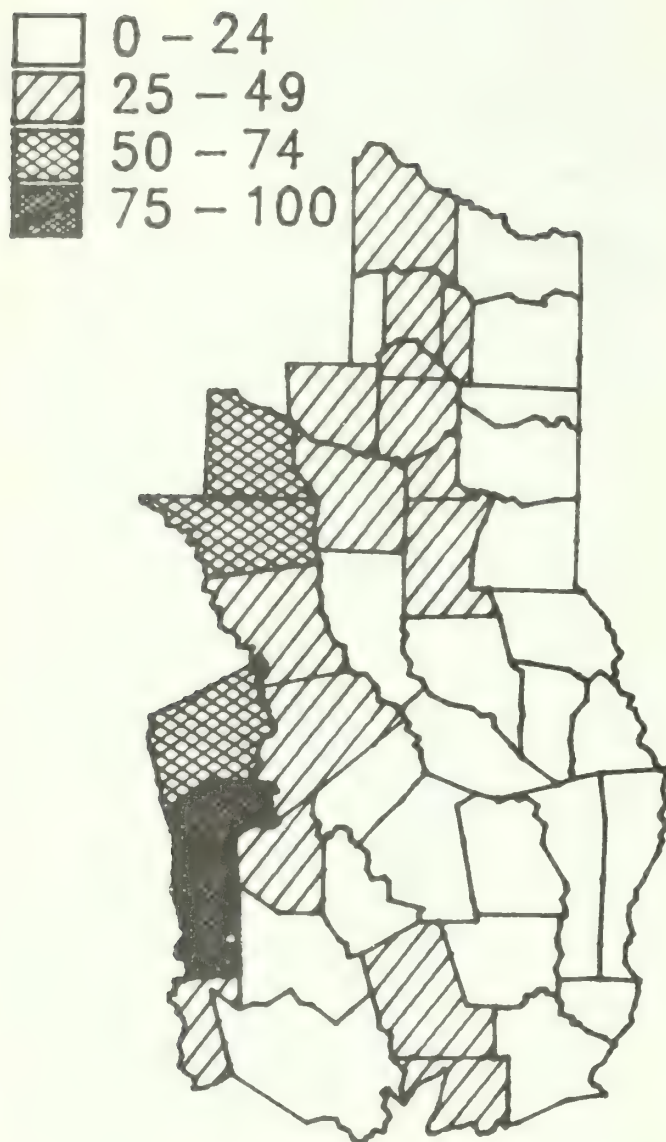


Figure 6.—Percent timberland with evidence of livestock use by county, East Texas, 1986.

WILDLIFE

Forest surveys provide analysis data on the habitat needs of forest-dwelling wildlife. A broad view of forest-dwelling wildlife can cover not only game species such as deer, wild turkey, quail, and squirrels but also songbirds, woodpeckers, reptiles, insects, and wildflowers. About 400 species of vertebrates (50 mammals, 250 birds, 100 amphibians and reptiles) inhabit a 10,000-acre tract of southeastern forest during a year—though less than 100 species on a given 10-acre forest tract at a specific time (Harris and others 1979).

Of the forest-dwelling wildlife, the red-cockaded woodpecker is one of the more extensively studied

nongame species. This endangered bird prefers older, relatively pure pine stands with a limited hardwood understory. Few such stands remain because many pine stands on private timberland are harvested within 50 years, or hardwoods are allowed to encroach on otherwise pure pine stands. Minimum criteria for estimating suitable habitat are unknown with certainty; unique conditions may create suitable habitat in localized areas. A tree age of 60 years is suggested as the minimum average age required for nesting (Lennartz and others 1983b). If a pine sawtimber stand with a stand age averaging 51 years or over contains a few 60-year-old trees, then the potential red-cockaded woodpecker nesting habitat amounts to 443,900 acres. (The 95 percent confidence interval is plus or minus 101,700 acres. Appendix Table A1 lists general estimates based on 2/3 [67 percent] confidence).

A more restrictive assumption, that hardwood tree basal area must be less than or equal to 20 percent of the total live tree basal area (Lennartz and others 1983b), yields an estimate of 142,449 acres. (The 95 percent confidence interval is plus or minus 58,400 acres.) Depending on assumptions, public timberland contains between $\frac{1}{4}$ to $\frac{1}{2}$ of the potential nesting habitat. Public acreage of southern pine stands designated as productive-reserved (54,900 acres, not surveyed and not part of the timberland estimate) may qualify as additional acreage with suitable red-cockaded woodpecker nesting habitat.

Some reports have suggested that red-cockaded woodpecker colonies prefer longleaf pine stands (Lennartz and others 1983b, Seagle and others 1987). The first forest survey in the 1930's (Cruikshank and Eldredge 1939) recorded 930,000 acres of longleaf forest type. Extensive timber cutting coupled with control of recurrent fires accelerated the demise of this once abundant ecosystem (see History section, McWilliams and Lord 1988). For the 1986 survey, 279,900 acres are longleaf-slash forest type, but only 34,700 acres (12 percent) contain a plurality of longleaf pine trees. Most of the remaining 245,200 acres consist of stands with a plurality of slash pine trees.

To examine habitat needs for the many other species that occur in forests is a major task. Because many forest-dwelling wildlife depend upon areas other than timberland and on plant species other than trees, some of the attributes needed to assess wildlife habitat values are incomplete. While a number of studies have examined understory plant species on southern timberland areas (Pearson and others 1987), shrub, vine, and herbaceous species inventories concurrent with this extensive area timberland survey are not avail-

able. Additional tree species (large diameter trees, snags, mast-producers) may occur in "stringers" (wooded areas too narrow or small to be classified as timberland or managed for commercial products) along landowner boundaries, narrow rights-of-way, and as windbreaks or fencerows adjacent to cropland. Amount of forest edge and the diversity of adjacent land cover, which are important for several species (e.g., deer and wild turkey), also are not quantified directly.

Characteristics of timberland are presented by forest types to aid in general comparisons. Details on wildlife and fish species associated with a given forest type are provided elsewhere (Dickson and Maughan 1987, Felix and others 1986). A coarse measure of adjacent land characteristics is provided by examining forest attributes of sampled areas aggregated at the county and multi-county regional level of resolution. Almost invariably, forest-dwelling wildlife depend upon forested areas with certain features—particular landform or moisture conditions, stand structure, and tree species, diameter class, and condition. The following summaries describe several attributes of forests: selected tree species distributions, stand size, forest type, ownership, mast, large diameter trees and snags.

Species Distributions

The regional distribution pattern of individual tree species can suggest the extent and aggregation of selected ecosystems or wildlife habitats—specific soil, landform, or dispersal conditions that support a unique assemblage of plant and animal species. Plot coordinates are derived from digitizing the location of a few plots and simulating the location of remaining plots by the 3-mile sample grid. Each dot represents a sample of the trees on a one-acre plot of timberland with at least one individual of that species. Because the regional sample design is systematic, approximate distributions are representative at the multi-county and regional scale. (Note that each dot represents about 5,760 acres.)

Tree species that are infrequently planted and that occur naturally only in restricted areas can suggest landform and soil conditions within the region. Unless otherwise indicated, soil and landform characteristics typical of a species' natural occurrence (in parentheses) are from Agriculture Handbook Number 271 (Fowells 1965). Figure 7 displays six selected tree species distributions: blackjack oak (dry, sandy soils with low organic content [Harrar and Harrar 1962, page 226]), laurel oak (well-drained sandy soils with nearby water), white oak (wide variety of upland soils except extremely dry and poorly drained bottom-

lands), willow oak (bottomlands, alluvial soils, rarely upland sites), overcup oak (bottomlands, poorly-drained and clay soils), and baldcypress (soils where moisture is abundant and fairly permanent).

Figure 8 contains distribution maps for the four major southern pine species: loblolly, shortleaf, slash, and longleaf pine. Because these pines are historically planted or managed, their distributions reflect human influences as well as landform conditions. Pines naturally occur and are widely planted or managed on a variety of sites, commonly in upland areas. Loblolly and shortleaf pine are widely distributed, suggesting they naturally occur or are planted in bottomlands as well as upland environments. Slash and longleaf pine are less widely distributed and occur predominately on the Southeast Coastal Plain. Slash pine, a species introduced to Texas in 1926 (Texas Forest Service 1963), occurs on sites coincident with longleaf pine. Slash pine also occurs more frequently beyond the Southeast Coastal Plain than longleaf pine.

Spanish moss (*Tillandsia* sp.) is one of the few non-tree species easily identified on forest survey plots. Spanish moss is an important component of bottomland hardwood stands. It provides important nesting material for the parula warbler and is a useful nesting material for other bird species. Spanish moss is considered aesthetically pleasing, and is of minor economic importance for specialty products. The occurrence and abundance of Spanish moss are linked to the availability of minerals in the canopy of host trees (Schlesinger and Marks 1977). The distribution of Spanish moss in timberland areas in figure 9 depicts conditions that favor its growth (regional abundance of host trees with high foliar leaching [e.g., cypress and oaks], and trees with limited bark and lower branch sloughing [most hardwoods]). Dispersal conditions (prevailing wind direction of major storms, continuous and connected areas of hardwood forest type) and a favorable climate (warm and humid conditions) may limit the natural range of Spanish moss to inland areas along relatively narrow river drainages (e.g., cypress-tupelo bottomlands) and the southern half of the Gulf Coastal Plain.

Stand Size, Forest Type, and Ownership

Some wildlife species are restricted to young clearcuts, others to mature, unbroken forest cover, and still others to the juxtaposition of land cover types (forest edges) where cropland or young clearcuts meet mature stands. Forest type, i.e., pine, oak-pine, and hardwoods, also plays a role in describing optimal conditions for individual

species. Additional information on the status of animal species in southern forests is provided in other publications (Pearson and others 1987). Related issues relevant to management of East Texas timberland for timber and wildlife are discussed by Campo (1986) and Ortego (1984).

To get a general view of wildlife habitat and past trends, forest survey data are examined by forest type, stand size class, and ownership for 1975 and 1986. There has been a net decline in sawtimber stands in pine forest types and an

increase in seedling and sapling stands (table 3). Shifts in stand dominance have favored loblolly pine over other pines in sapling and seedling stands.

In hardwood forest types, there has been a shift toward oak-pine and oak-hickory in sapling and seedling stands, and oak-hickory stands in pole-timber and sawtimber stand size classes (table 4). Bottomland hardwoods have declined as well. Some of the forest type shifts result from temporary changes in stand dominance as pine stands



Figure 7.—Timberland with selected tree species 1.0 inches d.b.h. and larger, East Texas, 1986.

are harvested. Gains in oak-hickory forest type, particularly in sawtimber and poletimber acreage, are linked to losses in oak-pine and some shortleaf pine stands. These shifts suggest hardwoods are succeeding pines as these stands get older and that selective removal of dominant pines is occurring without further pine timber management.

Timberland acreage has changed little since the 1975 survey—less than a 1 percent decline. Tim-

berland in public ownership, 763,000 acres, represents a decline of 9 percent, mainly due to designation of timberland to productive-reserved status. Public landholdings comprise 7 percent of the 1986 timberland. By stand-size class, 74 percent are sawtimber stands, 12 percent are poletimber stands, and 13 percent are sapling-seedling stands, virtually the same as in 1975.

Forest industries own 3,795,500 acres (33 percent), approximately the same proportion as in 1975. Sawtimber, poletimber, and sapling and seedling stands in 1986 represent 41, 18, and 39 percent respectively. By contrast, the 1975 proportions are 58 percent sawtimber stands, 20 percent poletimber stands, and 22 percent sapling and seedling stands. Nearly twice as many stands are in the sapling and seedling stand size class in 1986 as there were in 1975.

Most of the timberland, 7,006,900 acres (61 percent), continues in nonindustrial private landownership. By stand size class, 1986 acreage is 51 percent in sawtimber stands, 29 percent in poletimber stands, and 17 percent in sapling and seedling stands. This represents a small shift toward older stand size classes since the 1975 survey. (For 1975, percentages are 46, 30, and 23 percent respectively.)

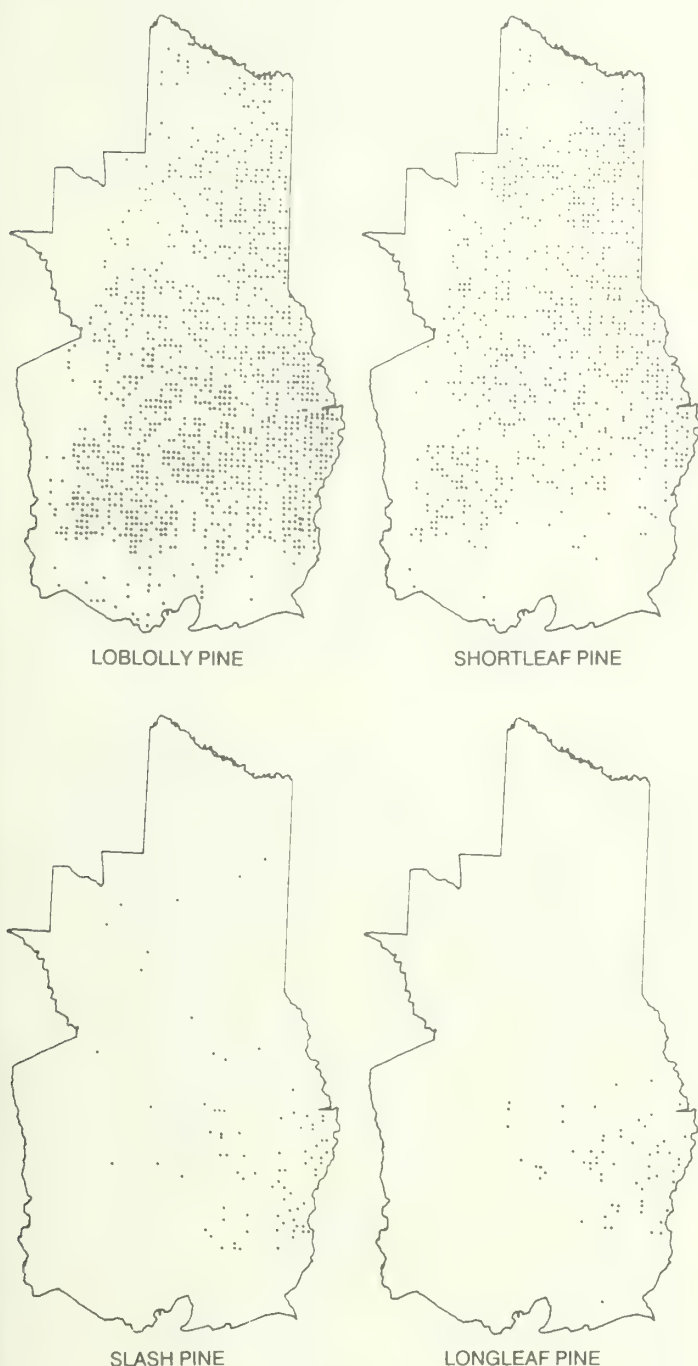


Figure 8.—Timberland with major pine species 1.0 inches d.b.h. and larger, East Texas, 1986.

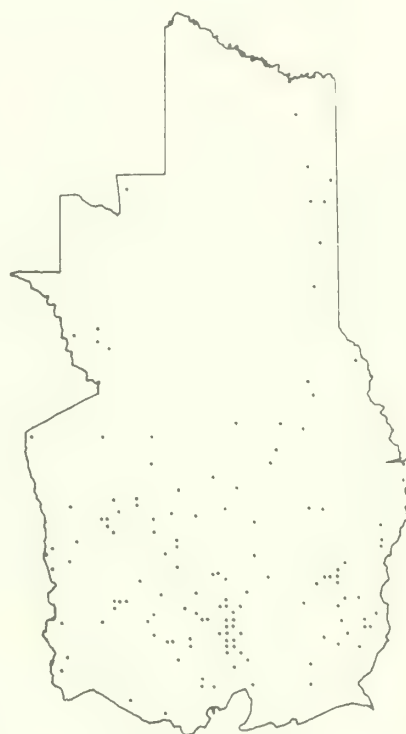


Figure 9.—Timberland with Spanish moss, East Texas, 1986.

Table 3—Area of pine timberland by stand-size class and detailed forest type, 1986, and change since 1975, East Texas¹

Stand size class	Loblolly-shortleaf ²				Longleaf-slash			
	Loblolly		Shortleaf		Slash		Longleaf	
	1986	Change	1986	Change	1986	Change	1986	Change
<i>Thousand acres</i>								
Sawtimber	1,761.1	-141	667.3	-196	66.8	+32	29.2	-12
Poletimber	597.0	+10	79.2	-154	121.8	+14	5.5	-0
Sapling-seedling	761.7	+161	50.8	-85	56.7	-13	0.0	-12
Nonstocked	6.0	+6	0.0	-6	0.0	+0	0.0	-0
All classes	3,125.8	+36	797.3	-441	245.2	+33	34.7	-24

¹Columns may not sum to totals due to rounding.

²Other detailed loblolly-shortleaf type: eastern redcedar, 13,600 acres, up 7,600 acres from 1975; all in sawtimber size class.

Table 4—Area of hardwood timberland by stand-size class and forest type, 1986, and change since 1975, East Texas¹

Stand size class	Oak-pine		Oak-hickory		Oak-gum-cypress		Elm-ash-cottonwood	
	1986	Change	1986	Change	1986	Change	1986	Change
	<i>Thousand acres</i>							
Sawtimber	1,226.8	-152	1,030.1	+230	879.2	-101	41.0	+2
Poletimber	462.1	-200	1,113.3	+232	428.8	+8	5.6	-35
Sapling-seedling	695.5	+145	1,052.8	+125	155.3	-100	5.7	-12
Nonstocked	17.3	+12	173.1	+103	55.9	+33	6.2	-0
All classes	2,401.8	-195	3,369.3	+691	1,519.1	-160	58.5	-45

¹Columns may not sum to totals due to rounding.

Mast

On timberland, hard mast or nuts (e.g., the fruit of oak, hickory, and beech) and soft mast (e.g., the soft or fleshy fruits of dogwood, blackgum, and cherries) are important food sources for many game and some nongame wildlife. Of these, oak and hickory nuts are most likely to be critical during the fall and winter months. For example, squirrel populations are positively correlated with acorn and hickory nut yields; populations generally lag 1 year behind nut supplies.

(Note that other food sources are essential to the survival of species that use mast as a major food supply, particularly in years of acorn crop failure. Mast from shrubs and vines, such as blackberries [*Rubus* sp.] and honeysuckle [*Lonicera* sp.], also are important.)

When available, acorns are generally the most common food sources for white-tailed deer, squirrel, and turkey during the fall and winter months, and are important to other game and many nongame wildlife species as well. Production of acorns

and other nuts varies by tree species, diameter class, crown position, and weather conditions (Shaw 1971, Goodrum and others 1971). Stands with a mixture of sawtimber-sized (11.0+ inches d.b.h.) tree species produce more consistently, as yields vary from year to year among species, and most species do not produce nuts abundantly until of sawtimber size.

Oaks comprise the majority of nut-bearing tree species in East Texas (table 5). Large numbers of sawtimber-sized post oak, water oak, and southern red oak occur across East Texas; differences in species composition by survey region are minor (table 6). By county, per-acre basal area of sawtimber-sized, nut-bearing tree species is lowest in central counties and highest in northwestern counties and a few southeastern counties (fig. 10). Counties with high basal area are those where oak-hickory sawtimber stands are abundant. Most differences are by forest type (fig. 11). Bottomland hardwoods (oak-gum-cypress and elm-ash-cottonwood) contain over 13 sawtimber-sized trees of nut-bearing species per acre, compared with only

3 sawtimber-sized trees per acre for pine (loblolly-shortleaf and longleaf-slash) stands.

Blackgum, hawthorn, and dogwood comprise the majority of fleshy fruit-bearing tree species on timberland (table 7). Average basal area of important fleshy fruit-bearing tree species is lowest in central counties and highest in southeastern counties and a few northern counties (fig. 12). Counties with high average basal area are those with abundant bottomland hardwoods. As with hard mast species, basal area per acre and number of trees per acre of most fleshy fruit-bearing tree species are more abundant in bottomlands (12 square feet, 108 trees), than oak-pine (5 square feet, 88 trees), oak-hickory (5 square feet, 78 trees), and pine forest types (3 square feet, 64 trees).

Large Trees and Snags

Many large-bodied birds of prey (e.g., bald eagle, barred owl) and mammals (e.g., squirrels, raccoons) require large diameter trees for nesting and perching. Large diameter live trees also are important foraging areas for some warbler species and a number of other bird species. On timberland, abundant large diameter live trees are prevalent only in the oak-gum-cypress forest type (table 8).

Cavity-nesting birds and mammals use snags (standing dead and dying trees) for nesting and foraging. Potential snags vary by condition—rotten, salvable dead (sound trees of timber species with merchantable volume), and nonsalvable dead (unsound timber trees as well as all dead

Table 5—Number of live trees of nut-bearing tree species on timberland by species and diameter class, East Texas, 1986¹

Species	All classes	Diameter class (inches at breast height)				
		1.0- 4.9	5.0- 10.9	11.0- 14.9	15.0- 20.9	21.0 & larger
-----Thousand trees-----						
Oaks						
White oaks						
Post	351,810	243,236	84,726	15,481	7,019	1,348
White	93,930	69,111	17,890	3,777	2,659	493
Overcup	19,611	9,130	6,823	1,825	1,404	428
Swamp chestnut	8,896	6,528	1,296	334	394	344
Chinkapin	97		65	32		
Bur	56		45		11	
Other white	45		45			
Total	474,445	328,005	110,890	21,449	11,487	2,613
Red oaks						
Water	223,579	168,203	37,361	9,827	6,079	2,110
Southern red	194,892	132,388	45,310	10,880	5,079	1,234
Willow	96,563	73,201	14,735	4,750	2,816	1,060
Blackjack ²	70,646	54,218	13,507	1,967	893	62
Cherrybark	67,247	51,323	11,005	2,630	1,529	759
Laurel	50,788	42,429	5,378	1,713	985	283
Bluejack ²	31,714	27,865	3,152	654	42	
Black	25,630	22,019	2,733	441	383	54
Shumard	15,624	14,333	716	258	171	146
Nuttall	812		491	119	120	83
Live ²	81			47	34	
Other red	42		42			
Total	777,618	585,979	134,430	33,286	18,131	5,791
All oaks	1,252,063	913,984	245,320	54,735	29,618	8,404
Hickories						
Water	16,285	11,644	3,500	817	252	72
Pecan	2,220	1,145	768	193	73	41
Other	166,458	134,222	25,451	5,124	1,547	113
All hickories	184,963	147,011	29,719	6,134	1,872	226
Bluebeech ²	165,145	150,354	14,462	329		
Ironwood ²	96,697	88,193	8,391	114		
American beech	6,058	3,050	1,140	922	704	242
Allegheny chinkapin	3,147	3,021	126			
Chinkapin (other) ²	2,405	2,202	203			
Black walnut	3,011	2,274	553	161	10	12
All species	1,713,489	1,310,089	299,914	62,395	32,204	8,884

¹Rows and columns may not sum to totals due to rounding.

²Noncommercial species.

Table 6—Number of live sawtimber trees of nut-bearing species by species and survey region, East Texas, 1986

Species	Survey region		
	Statewide	Southeast	Northeast
----- Trees per 1000 acres -----			
Oaks			
White oaks			
Post	2,062	2,035	2,082
White	599	708	519
Overcup	316	249	366
Swamp			
chestnut	93	217	2
Chinkapin	3		5
Bur	1		2
Total	3,074	3,209	2,976
Red oaks			
Water	1,558	2,293	1,018
Southern red	1,487	1,554	1,437
Willow	746	731	757
Cherrybark	425	588	306
Laurel	258	600	7
Blackjack ¹	253	129	344
Black	76	27	112
Bluejack ¹	60	11	96
Shumard	50	46	52
Nuttall	28	64	1
Live ¹	7	16	
Total	4,948	6,059	4,130
All oaks	8,022	9,268	7,106
Hickories			
Water	99	171	46
Pecan	27	32	22
Other	587	514	640
All hickories	713	717	708
American beech	162	364	13
Bluebeech ¹	28	32	26
Black walnut	16	10	20
Ironwood ¹	10	16	5
All species	8,951	10,407	7,878

¹Noncommercial species.

trees of nonmerchantable trees). Optimum dead tree densities for cavity nesting bird species vary with what is considered adequate. Estimates range from 212 trees per 100 acres to 1,170 trees per 100 acres, with the majority of trees in small diameter classes (McComb and others 1986b). Another study suggests that larger diameter snags have an advantage over smaller snags, as larger snags, while not abundant, are favored by birds over the smaller trees (Morrison and others 1986).

Data on snags by diameter class, condition, forest type, and ownership provide indices of cavity-nesting wildlife habitat. Rotten trees are relatively rare in pine stands but are much more abundant in oak-gum-cypress stands (table 9). Dead trees (salvable dead plus standing nonsalvable dead) are present at an average density of 547 per 100 acres, although the majority are in the

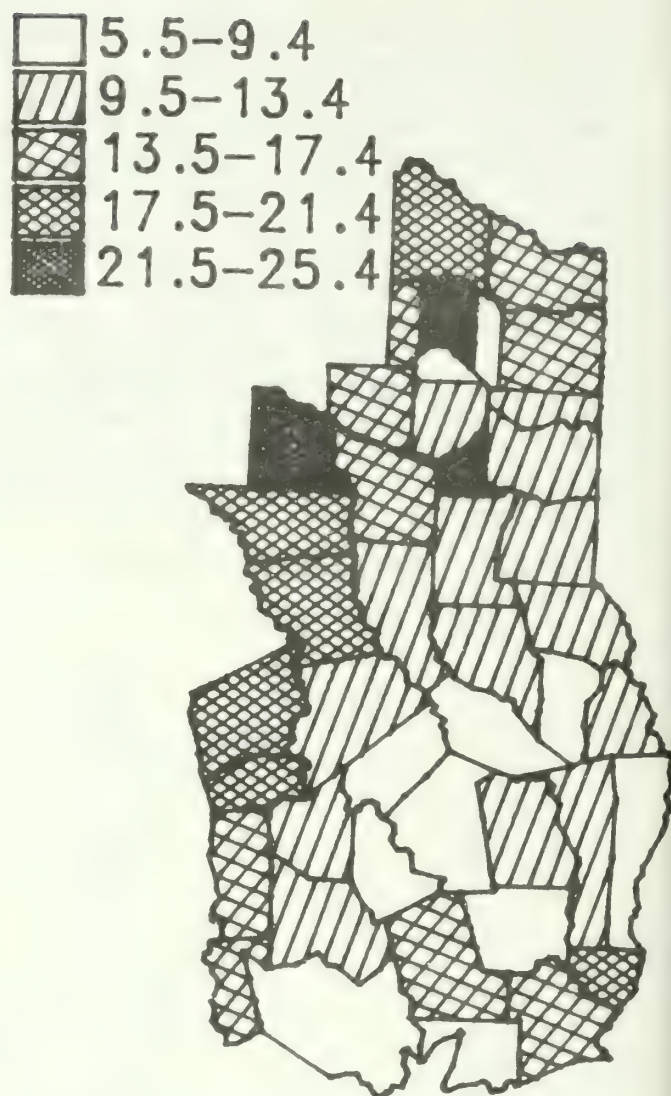


Figure 10.— Basal area of sawtimber-sized nut-bearing tree species per acre of timberland by county, East Texas, 1986.

smaller diameter classes (table 10). The larger diameter dead trees are relatively rare; they are more frequent in hardwood stands (table 11). Salvable dead trees are not as common in bottomland hardwoods and longleaf-slash forest types as in loblolly-shortleaf, oak-pine, and oak-hickory forest types (fig. 13). Standing nonsalvable dead trees are not as frequent in longleaf-slash forest type as in other forest types. Bottomland hardwood stands contain the most standing nonsalvable dead trees in all diameter classes (figure 14).

Examination of tree numbers by ownership and forest type suggests forest industry timberland contains fewer potential snags, except in bottomland hardwood stands (table 11). The density of den trees (live cavity-bearing trees, most of which are classed as rotten trees) has generally been greater in hardwood stands and on public lands

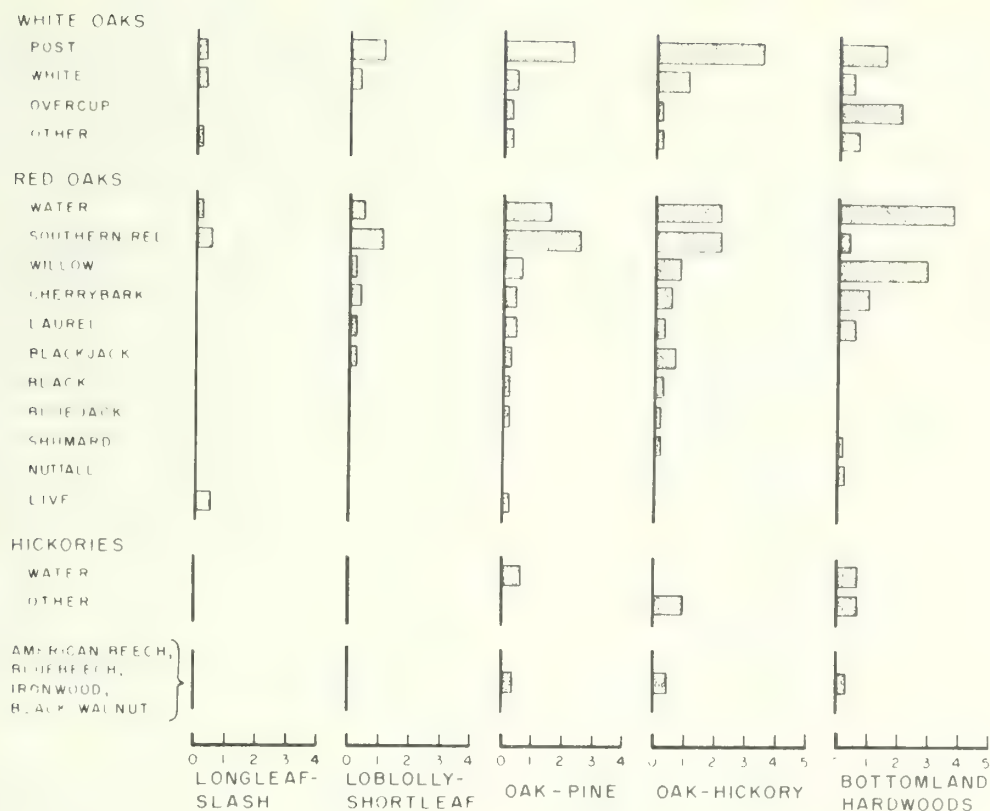


Figure 11.— Number of live sawtimber trees of nut-bearing hardwood species per acre by species and forest type, East Texas, 1986.

Table 7—Number of live trees of fleshy fruit bearing species on timberland by species and diameter class, East Texas, 1986¹

Species	Diameter class (inches at breast height)					
	All classes	1.0- 4.9	5.0- 10.9	11.0- 14.9	15.0- 20.9	21.0 & larger
----- <i>Thousand trees</i> -----						
Blackgum	237,374	204,031	26,652	4,306	1,878	508
Hawthorn	155,343	153,174	2,140	30		
Dogwood	144,128	141,020	3,108			
Holly	87,452	79,944	6,645	265	64	
Sugarberry and hackberry	69,726	53,461	12,969	2,259	916	121
Persimmon	42,875	41,573	1,198	94	10	
Eastern and southern redcedar	40,755	34,023	5,833	662	211	26
Prunus sp.						
Black cherry	15,883	14,421	1,421	29	12	
Other	20,916	19,905	976	35		
Mulberry	23,750	21,512	2,040	141	56	
Water tupelo	11,318	7,027	2,425	1,101	668	98
Total	849,522	770,091	65,406	8,922	3,816	752

¹Rows and columns may not sum to totals due to rounding.

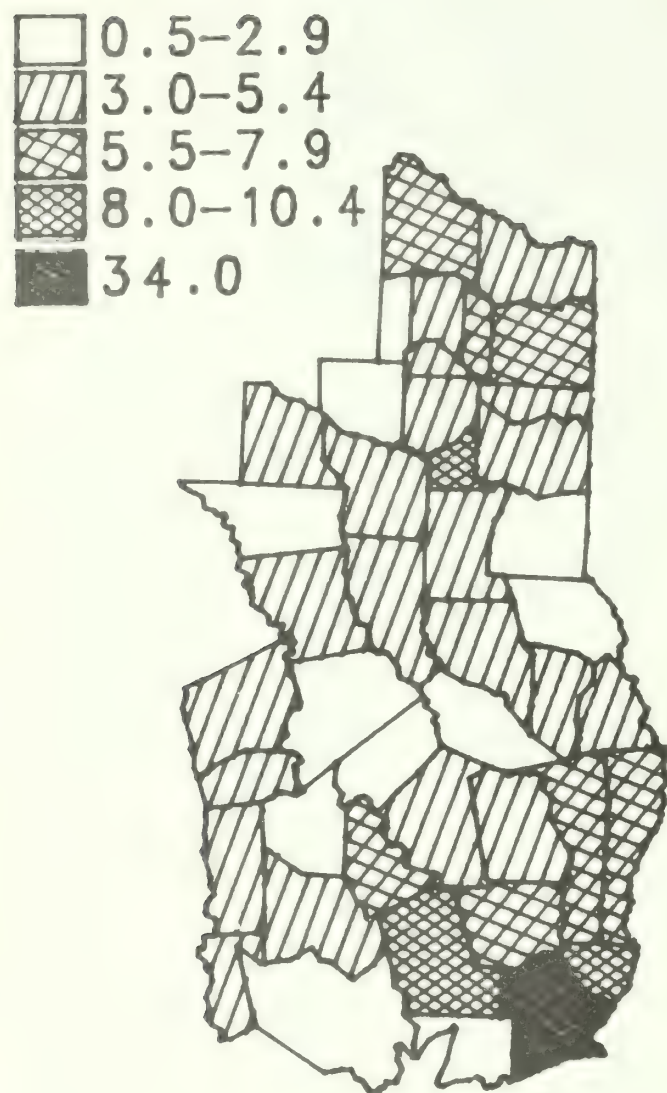


Figure 12.— Basal area of fleshy fruit producing tree species per acre of timberland by county, East Texas, 1986.

in Florida and South Carolina (McComb and others 1986a). Reduced standing dead tree densities have been noted for pine stands (Harlow and Guynn 1983; McComb and others 1986b, Rudis 1988), and for pine type forest industry lands in Florida (McComb and others 1986b) and Louisiana (Rudis 1988).

Patterns in large diameter trees and snags are due in part to differences in stand maturity by forest type and ownership. Many of the pine stands (loblolly-shortleaf and longleaf-slash) are relatively young (McWilliams and Lord 1988) and have not matured sufficiently to develop snags or large diameter trees, particularly when compared with older bottomland hardwood stands. Forest industry acreage is younger in pine, oak-pine, and oak-hickory stands, than comparable forest types in public or other private ownerships (McWilliams and Lord 1988). Differences in management priorities to retain multiple values on public and private timberland also can contribute to the relative abundance of snags and larger trees in pine stands.

RECREATION AND OTHER VALUE INTERACTIONS

The East Texas landscape contains the State's only extensively forested environment. Income from recreational uses of timberland comes directly from recreational activity leases (mainly for hunting, but also fishing, camping, and horseback riding), and indirectly from motels, campgrounds, sporting goods shops, restaurants, and the transportation industry. Leasing timberland for recreation promotes surrogate ownership that helps protect timberland from poaching, trash dumping, arson, and vandalism (Allen 1987). Monetary

Table 8—Number of large diameter live trees on timberland by diameter class and forest type, East Texas, 1986¹

Forest type	Total	Diameter class (inches at breast height)				
		21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0 & larger
.....Trees per 100 acres.....						
Longleaf-slash	17	16	.	.	.	2
Loblolly-shortleaf	142	78	34	17	7	6
Oak-pine	148	63	39	23	9	14
Oak-hickory	126	53	30	18	10	14
Oak-gum-cypress	345	137	87	48	26	47
Elm-ash-cottonwood	223	2	2	2	2	2
All types	256	117	63	35	17	24

¹Rows may not sum to totals due to rounding.

²Insufficient sample size.

Table 9—Number of rotten trees on timberland by diameter class and forest type, East Texas, 1986¹

Forest type	Total	Diameter class (inches at breast height)				
		5.0-8.9	9.0-12.9	13.0-16.9	17.0-20.9	21.0 & larger
-----Trees per 100 acres-----						
Longleaf-slash	28		9	19		
Loblolly-shortleaf	129	63	26	21	11	8
Oak-pine	259	70	65	64	33	27
Oak-hickory	313	122	69	57	32	33
Oak-gum-cypress	445	124	99	82	70	70
Elm-ash-cottonwood	277	1	1	1	1	1
All forest types	249	88	56	49	29	27

¹Insufficient sample size.

Table 10—Number of dead trees on timberland by diameter class and forest type, East Texas, 1986¹

Forest type	Total	Diameter class (inches at breast height)				
		5.0-8.9	9.0-12.9	13.0-16.9	17.0-20.9	21.0 & larger
-----Trees per 100 acres-----						
Longleaf-slash	335	207	109	11	5	3
Loblolly-shortleaf	552	400	90	42	15	5
Oak-pine	492	315	101	51	17	8
Oak-hickory	552	331	130	54	22	15
Oak-gum-cypress	658	342	173	90	30	23
Elm-ash-cottonwood	327	1	1	1	1	1
All forest types	547	348	116	53	19	11

¹Insufficient sample size.

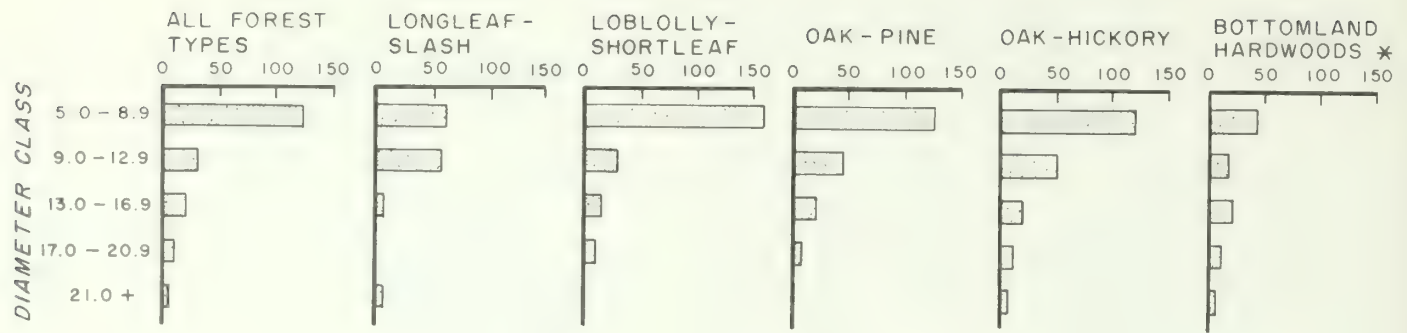
Table 11—Number of rotten, salvable dead, and standing nonsalvable dead trees 5.0 inches or more in diameter by forest type and ownership, East Texas, 1986

Forest type and ownership	Total	Rotten	Salvable dead	Standing nonsalvable dead
-----Trees per 100 acres-----				
Pine ¹				
Public	858	70	377	411
Forest industry	490	109	129	252
Nonindustrial private	750	145	225	380
All owners	660	122	205	333
Oak-pine and oak-hickory				
Public	941	278	107	556
Forest industry	634	262	135	237
Nonindustrial private	889	303	228	358
All owners	817	290	197	330
Bottomland hardwoods ²				
Public	³	³	³	³
Forest industry	1,103	392	75	636
Nonindustrial private	1,091	465	75	551
All owners	1,086	439	81	566
All forest types				
Public	879	145	290	444
Forest industry	625	209	126	290
Nonindustrial private	880	282	204	394
All owners	796	249	184	363

¹Includes longleaf-slash and loblolly-shortleaf forest types.

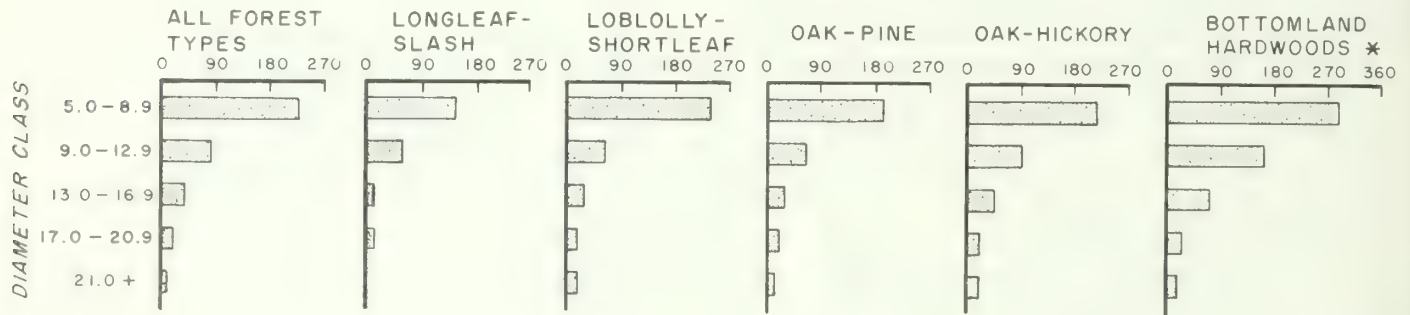
²Includes oak-gum-cypress and elm-ash-cottonwood forest types.

³Insufficient sample size.



* INCLUDES OAK-GUM-CYPRESS AND ELM-ASH-COTTONWOOD FOREST TYPES

Figure 13.— Number of salvable dead trees per 100 acres by diameter class and forest type, East Texas, 1986.



* INCLUDES OAK-GUM-CYPRESS AND ELM-ASH-COTTONWOOD FOREST TYPES

Figure 14.— Number of standing nonsalvable dead trees per 100 acres by diameter class and forest type, East Texas, 1986.

incentives for leasing are present as well, with hunting leases averaging \$2.50 per acre Statewide, and some that are as high as \$25 per acre (Gramann 1987). Other hunting expenditures that generate income to local economies (e.g., for lodging, equipment, etc.) are considerable as well (Adams and Thomas 1983). Tourism promotion, allowing public access to private timberland, and development of well-planned regional forest trails, waterways, and scenic areas are some of the ways communities enhance indirect income-generating recreational opportunities. Managing timberland for other forest values (e.g., game species, aesthetics) also has a public relations benefit, an important incentive to industrial timber producers and others with large landholdings.

Timberland with the greatest number of recreation users is likely to be near water and populated areas (as in Alabama [Rudis 1987]). One-third of the timberland in East Texas (3,800,000 acres) is within 1,600 feet of permanent water bodies; one-sixth of this amount (600,000 acres) is also within 1 mile of urban or built-up areas and within ¼ mile of roads.

In addition to water and populated acres, timberland areas with the most users for dispersed recreational activities are those with unique features, easy access, and close proximity to developed facilities. Several characteristics—such as remoteness (isolation from human intervention), location in relation to population centers, available facilities, aesthetics, and fire—influence recreation as well as the multiple values of timberland.

Remoteness

Remote timberland areas are relatively rare in the Midsouth states (Rudis 1986). Such areas traditionally are the lands with limited opportunities for development—usually poorly drained bottomlands and mountainous areas with steep slopes where road-building is costly, and areas where soils, land management, or economic conditions favor forest cover over cropland or urban or built-up land. When located near designated wilderness or natural forest vegetation areas, remote timberland areas act as buffers against conflicting land

uses. Remote timberland areas are important to recreation users and others interested in conserving areas isolated from civilization, and are valued by wildlife in need of seclusion.

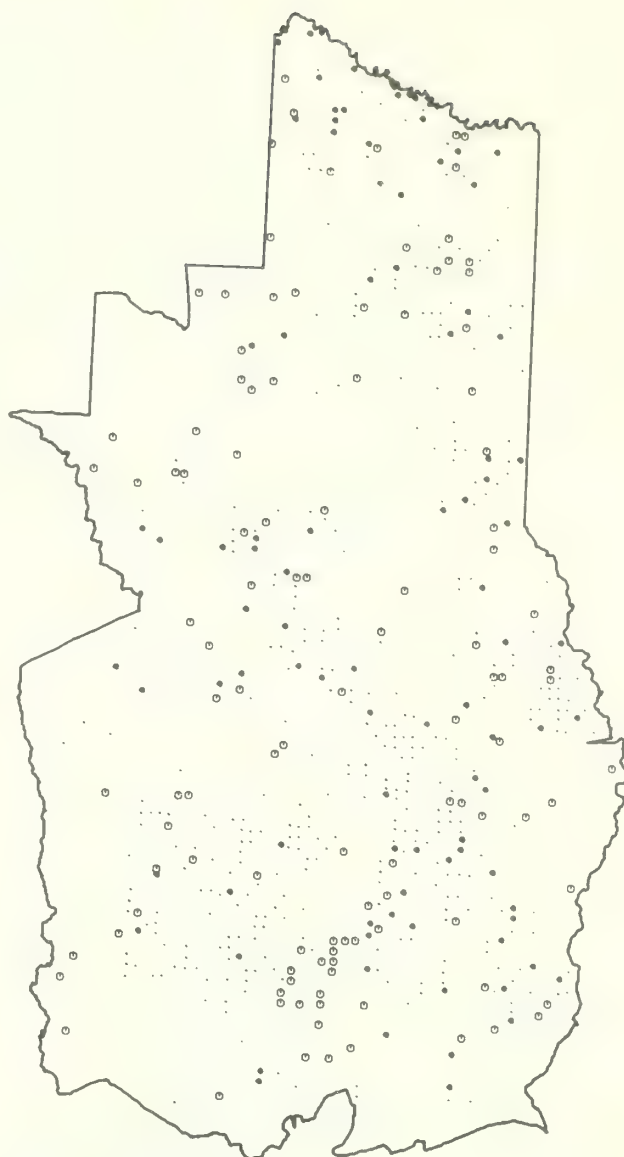
Estimates of remote timberland areas in this report are based on forest size (area of contiguous forest land) and distance from roads (all-weather roads, or otherwise truck-operable roads) (table 12). Timberland that is a part of large tracts (2,500 acres or more) represents 22 percent of East Texas' timberland and 24 percent (2,956 million cubic feet) of the growing-stock volume. Timberland distant from roads ($\frac{1}{2}$ mile or more from roads) represents 1,200,000 acres (10 percent) and 1,334 million cubic feet of growing-stock volume (11 percent).

Remote timberland is widely scattered throughout the region. Most of the acreage part of 2,500 acre tracts or $\frac{1}{2}$ mile or greater from roads is concentrated in the south central portion (fig. 15). Timberland distant from roads and part of large tracts is relatively rare—representing only 4 percent (500,000 acres). Of this amount, 37 percent occurs in bottomland hardwood forest types, while 48 percent occurs in upland hardwoods and 15 percent occurs in pine forest types (table 13).

(Nontimberland that is forested may contain acreage that is considered remote. This "productive-reserved forest land" amounts to 119,726 acres. Detailed measurements in this area are not conducted as part of the timberland survey).

Access

Physical access to East Texas timberland is relatively good, as 86 percent of the timberland is within $\frac{1}{4}$ mile of roads, and many residents of the area are within a 1-day drive of a variety of timberland areas. Approximately 22 percent of the roads are paved, 56 percent are dirt or gravel, and 8 percent are right-of-ways or for 4-wheel drive



- Greater than $\frac{1}{2}$ mile from roads
- 2,500 acres or more
- Less than 2,500 acres
- Less than $\frac{1}{2}$ mile from roads
- 2,500 acres or more

Figure 15.— Remote timberland by forest tract size and distance from roads, East Texas, 1986.

Table 12—Area of timberland by size of tract and distance from roads, East Texas, 1986¹

Size of tract (acres)	Total	Distance from roads (miles)				
		0-<¼	¼-<½	½-<¾	¾-<1	1 or more
----- <i>Thousand acres</i> -----						
1-10	132.8	100.2	32.6	...	...	...
11-50	538.1	473.6	39.6	18.7	6.3	...
51-100	848.3	694.5	129.1	12.2	6.2	6.3
101-500	3,303.1	2,569.1	559.8	118.8	24.3	31.1
501-2,500	4,202.8	2,822.4	923.3	348.9	59.3	48.9
2,501-5,000	1,596.4	823.9	424.5	213.6	61.4	73.0
More than 5,000	943.8	553.6	194.6	93.5	41.4	60.8
Total	11,565.3	8,037.2	2,303.4	805.7	198.9	220.1

¹Rows and columns may not sum to totals due to rounding.

Table 13—Area of timberland by size of tract, distance from roads, and forest type, East Texas, 1986¹

Size of tract	Total	Pine ²	Upland hardwoods ³	Bottomland hardwoods ⁴
<i>-----Thousand acres-----</i>				
2,500 acres or more				
½ mile or more from roads	543.7	84.1	259.2	200.4
less than ½ mile from roads	1,996.5	839.4	907.8	249.4
Less than 2,500 acres				
½ mile or more from roads	681.0	163.0	285.8	232.2
less than ½ mile from roads	8,344.1	3,130.1	4,318.3	895.7
Total	11,565.3	4,216.6	5,771.1	1,577.7

¹Rows and columns may not sum to totals due to rounding.

²Includes longleaf-slash and loblolly-shortleaf pine forest types.

³Includes oak-pine and oak-hickory forest types.

⁴Includes oak-gum-cypress and elm-ash-cottonwood forest types.

vehicles only. Potential limitations on recreation access include “no trespassing” or “keep out” signs (13 percent of the timberland) and fences (61 percent of the timberland).

Access to timberland may be restricted by private landowners who control most of the timberland acreage (33 percent forest industries, 61 percent other private landowners, and 6 percent public agencies). Agreements to allow public access to private timberland and involvement by private landowners in supplying other forest values benefit the well-being of communities, and can provide financial returns, particularly where there are shortages.

Location

In addition to road distance, timberland's recreation value depends on its proximity to population centers. County population density is greatest in Harris and Gregg counties (fig. 16). Ten-year projections of county populations suggest most of the growth is expected in Gregg, Harris, and Montgomery counties, with surrounding counties receiving substantial increases in population density (fig. 17). Montgomery County has a projected annual population growth rate of 5 percent, one of the highest rates in the United States.

Examination of timberland by State planning districts allows one to consider the pool of potential recreation users and forest resources from surrounding counties. There are inequities in the distribution of timberland, but the variety of forest types are represented in each of the planning districts (fig. 18). Each of the State's planning districts have some timberland, though the majority is in Lufkin/Nacogdoches district. Most of the acreage in East Texas is in nonindustrial private ownership, except in Lufkin/Nacogdoches where forest industries control half of the acreage (table

14). Public timberland, 763,000 acres, is supplemented by productive-reserved forest land acreage in the districts of Houston (5,000 acres), Lufkin/Nacogdoches (67,000 acres), and Beaumont/Port Arthur (48,000 acres).

Timberland per resident ranges from 0.49 acres in the Houston district to 15.58 acres in the Lufkin/Nacogdoches district. Visitors that use timberland for recreation frequently outnumber the resident population. According to information gathered by the Texas Parks and Wildlife Department (TPWD), Tyler and Texarkana district are particularly influenced by users from the Dallas-Ft. Worth metropolitan area (TPWD 1985). The rural character of the Lufkin/Nacogdoches district, coupled with its relatively abundant freshwater lakes, attracts many nonresidents, particularly from the Houston metropolitan area (TPWD 1985).

The expansion of major cities, such as Houston, Tyler, and Dallas-Ft. Worth, and an increase in cropland and pastureland reduces timberland area, increases the demand for nontimber and timber values to remaining forests. Urban expansion, coupled with development for water impoundments and roads, has diverted 500,000 acres out of timberland between 1975 and 1986. Clusters of diverted acres to urban and other uses (plus signs in figure 19) suggest growth of Tyler, Longview, and Houston as contributing to the decline in timberland. Conversion of timberland to nontimberland in the near future is likely for some of the acreage within one mile of urban areas (large dots and open circles in figure 19), particularly those also within 200 feet of a road (open circles in figure 19).

Nontimber uses influence timberland near water sources, urban areas, and agricultural areas. Timberland associated with water (fig. 3) has

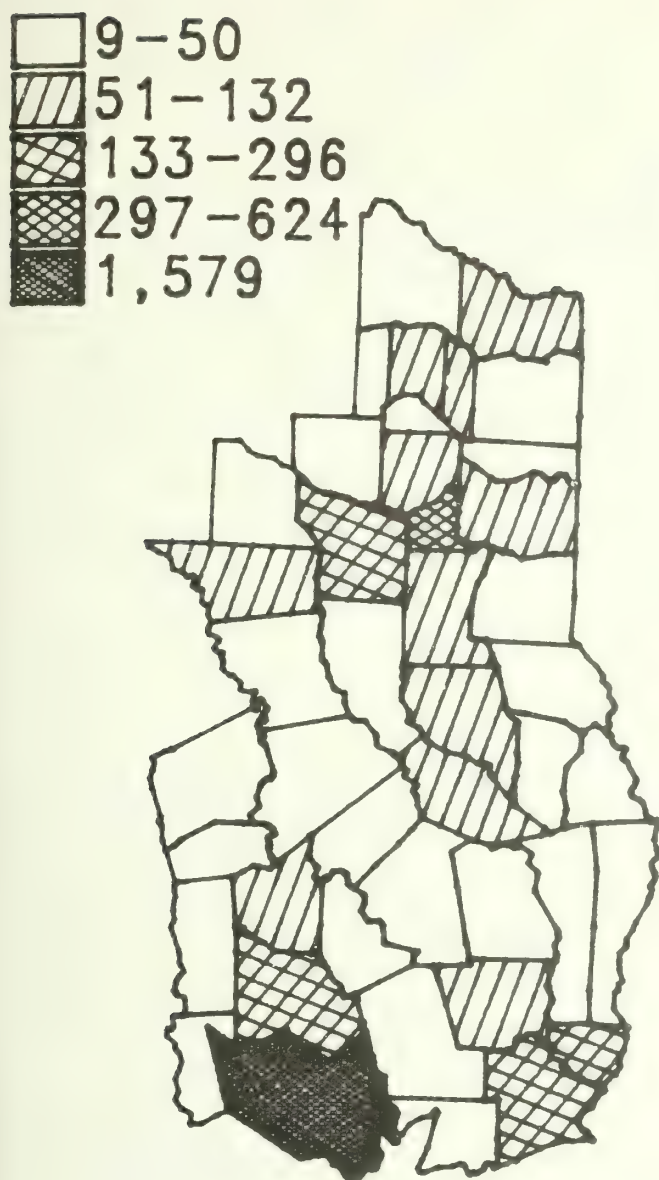


Figure 16.— *Population density per square mile by county, East Texas, 1985. (Projection from 1980 U.S. Census by Texas Department of Water Resources, 1981).*

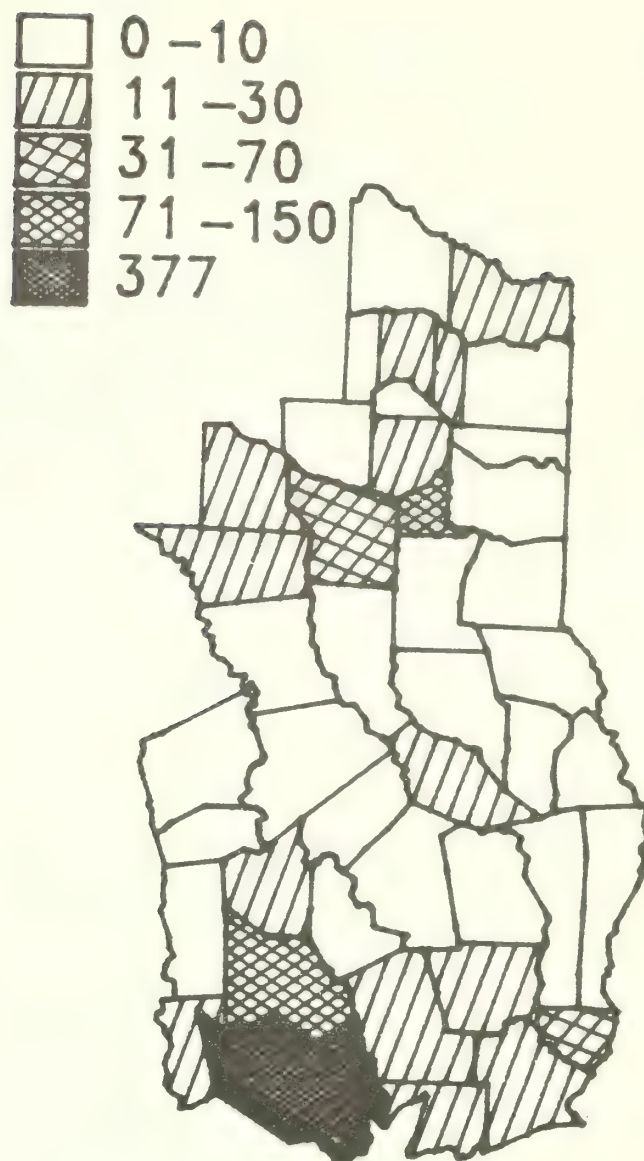


Figure 17.— *Increase in population density per square mile by county, East Texas, 1985-1995. (Projection from 1980 U.S. Census by Texas Department of Water Resources, 1981).*

Table 14—*Population, timberland area per person, and timberland area by ownership and State planning district for the East Texas survey region, 1986¹*

State planning district	Population	Timberland area per resident	All owners	Public	Forest industry	Nonindustrial private
	<i>Thousands</i>	<i>Acres</i>	<i>Thousand acres</i>			
Houston	3,056	0.5	1,500.4	112.4	236.0	1,152.0
Tyler	641	4.6	2,944.3	29.7	375.0	2,539.4
Beaumont/Port Arthur	396	1.5	606.9	...	380.6	226.3
Lufkin/Nacogdoches	311	15.6	4,840.4	548.7	2,602.6	1,689.1
Texarkana	177	6.7	1,192.3	72.0	179.4	940.9
Bryan/College Station	37	12.9	481.0	...	22.0	459.0
Total	4,617	2.5	11,565.3	762.9	3,796.5	7,006.9

¹Rows and columns may not sum to totals due to rounding.

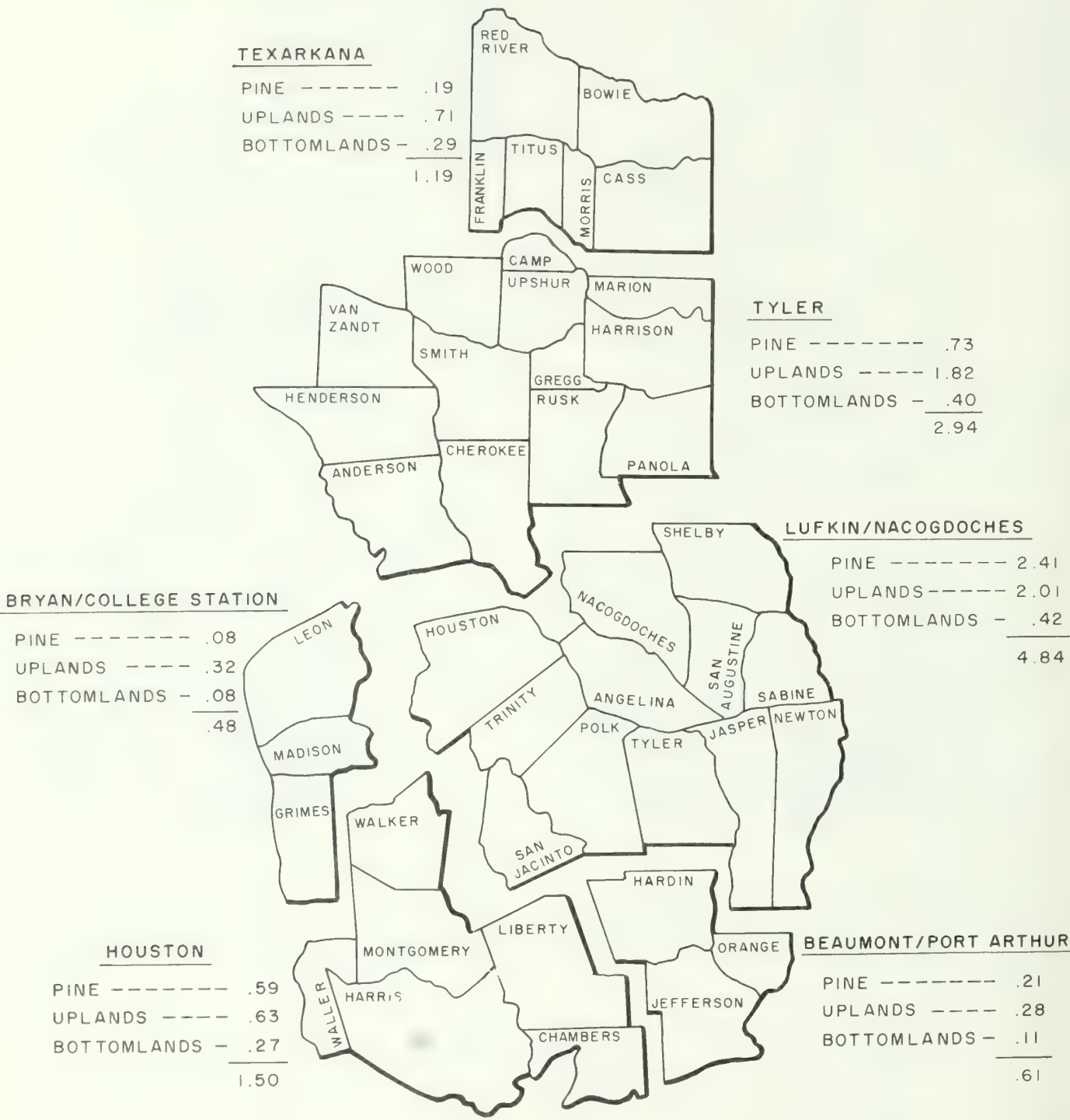
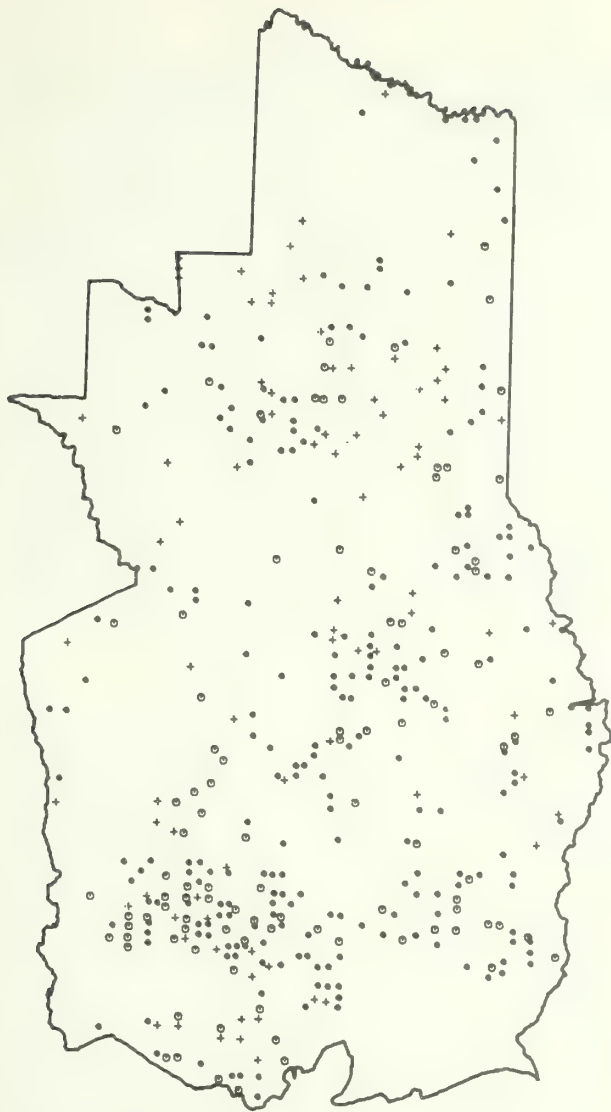


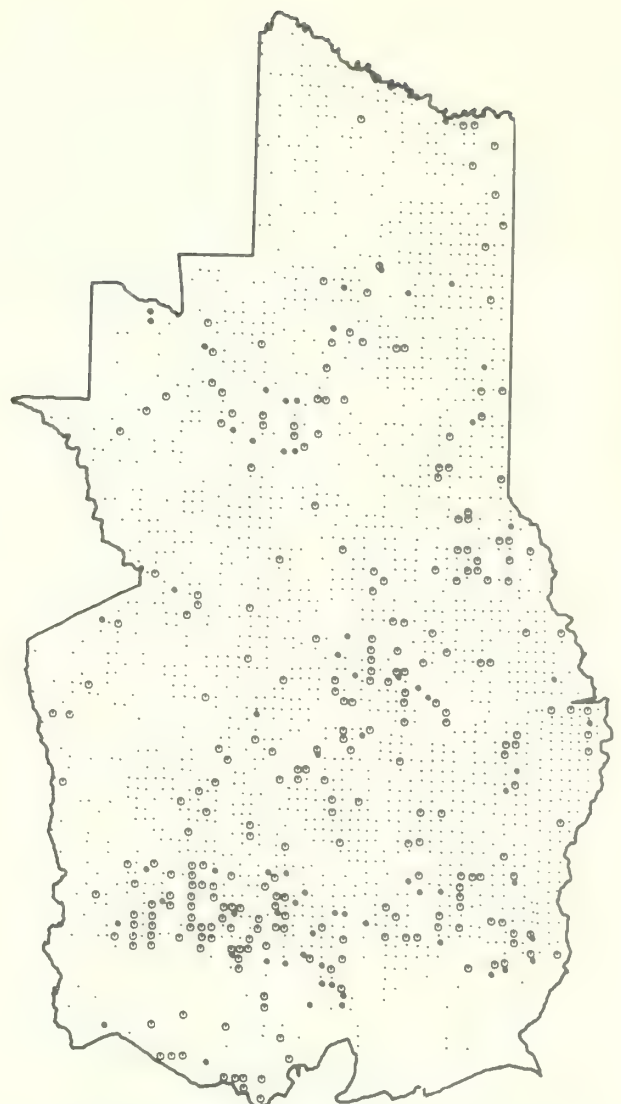
Figure 18.— Timberland by planning districts and forest type, East Texas, 1986. Pine=longleaf-slash, loblolly-shortleaf; uplands=oak-pine, oak-hickory; bottomlands=oak-gum-cypress, elm-ash-cottonwood. Columns may not sum to totals due to rounding.



- + Former timberland (1975)
diverted to urban and other uses
- Timberland within 200 feet of a road
and within 1 mile of urban or built-up land
- Timberland within 1 mile of urban or built-up land

Figure 19.—Timberland or former timberland with potential for diversion to urban and other nonagricultural uses, East Texas, 1986.

already been discussed. Urban influences on timber management operations—a shift in fire control priorities toward forests near buildings, reduced opportunities for fire in harvest and management operations, increased visibility of timber production operations, real estate speculation, and recreational use—are generally greater when closer to urban areas and roads. The timberland-urban land interface (fig. 20) represents an area where serious fire suppression/protection problems can arise and where use of fire in timber management can confront public concerns for limiting pollution and conserving wildlife and aesthetics. Clusters illustrate the proximity of major cities to timberland areas (fig. 20). The

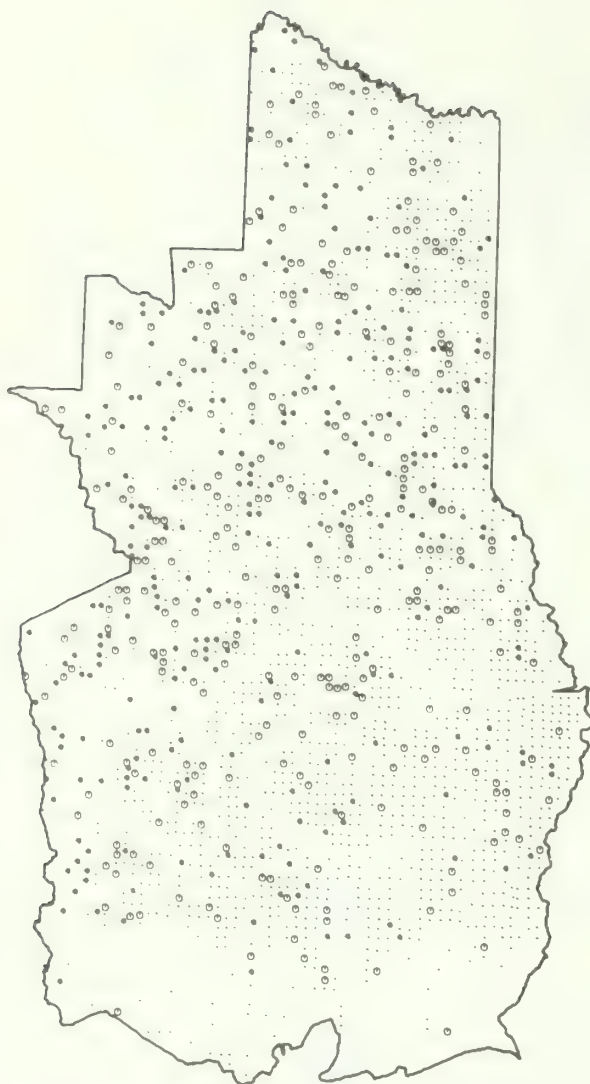


- Less than 1 mile urban or built-up land
and within 1,200 feet of a road
- Less than 1 mile urban or built-up land
and more than 1,200 feet of a road
- 1 mile or more from urban or built-up land

Figure 20.—Timberland by proximity to urban and built-up land and roads, East Texas, 1986.

1,561,000 acres of timberland within 1,200 feet of roads and within one mile of urban or built-up land represent 13.5 percent of the acreage and 14.6 percent of the growing-stock volume (1,816 million cubic feet).

Agricultural influences on timberland—occasional multiple use, such as grazing by livestock, beekeeping, firewood and fencepost harvesting for personal use, and temporary diversions to cropland—are most likely to occur where land in agricultural use is dominant. In East Texas, timberland associated with agricultural land is found mainly in northern and western parts of the region (fig. 21). The 1,940,000 acres of timberland within 200 feet of agricultural land represents 16.7 per-



Distance from agricultural land
 • 200 feet or less
 ○ 300 - 600 feet
 • 700 feet or more

Figure 21.— *Timberland by proximity to agricultural areas, East Texas, 1986.*

cent of the region's timberland, and 11.6 percent (1,442 million cubic feet) of the growing-stock volume. Between 1975 and 1986, most of the timberland diverted to agriculture (367,000 acres) and most timberland recently reverted from agriculture (633,700 acres) came from the northern and western parts of the region. A net increase in tree planting, soil conservation programs, and an economic downturn in short-term crop or livestock production could increase timberland in these same areas.

Activities

In this report, recreation activities considered are those associated with dispersed forested areas. Direct use of timberland occurs with activities such as hunting, primitive camping, and hiking.

Indirect use occurs with activities such as sight-seeing, picnicking, freshwater fishing, and boating.

Areas associated with outdoor recreation activities influence and are influenced by timberland management, as forests provide the setting for many activities. Developed recreation acreage is concentrated near the urban areas, in Harris and Jefferson counties (fig. 22). Undeveloped acreage represent areas with recreation development potential or areas devoted to nature conservation, hunting, and other multiple uses (including timber management). Counties with appreciable undeveloped acreage occur in the south central portion of East Texas where the National Forest System is a major landholder (fig. 23). Sabine, Polk, Harris, Smith, and Henderson counties contain the highest concentration of campsites (fig. 24). Developed shoreline for water-related activities are abundant in only a few counties: Harris, Polk, and Sabine (fig. 25).

The Texas Parks and Wildlife Department indicates that overuse of recreation facilities has created problems in selected areas due to the unequal distribution of suitable areas relative to demand. Intense human activities near water bodies have resulted in soil erosion and reduced water quality, particularly on slopes adjacent to the more limited recreational lakes in the Northeast Survey Unit (TPWD 1985, p. 5-2). Limited public access to other rivers and lakes and crowding at existing access points excludes potential recreation users. Hunting pressure, intensified by a the lack of uniform procedures among landholders for the taking of game, has reduced hunter success rates in the Lufkin/Nacogdoches district (TPWD 1985, p. 14-2). Actions planned by the agency to reduce problems include promoting infrequently used areas to alleviate overuse in more well-known areas, seeking additional funds for maintenance and acquisition of recreation and conservation areas, and augmenting cooperative efforts among public agencies and the private sector to provide recreation opportunities (TPWD 1986).

Aesthetics

Tourism and recreation industries and individual communities are influenced by forest resources. Continuous management of forests to maximize wood production conserves timber values but has the potential for reducing aesthetics and other nontimber values. Dedication of timberland to conserve nontimber values, either by government action or through decisions by private landowners, ensures that such values are preserved in the short term but requires active management to maintain aesthetics as forest vegetation matures.

An alternative to exclusive land dedication is to



Figure 22.— *Acres of land developed for recreation by county, East Texas, 1985 (TPWD 1985). Each dot represents 100 acres.*

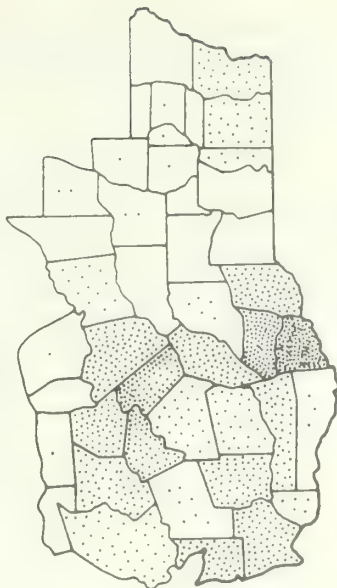


Figure 23.— *Acres of undeveloped land for recreation by county, East Texas, 1985 (TPWD 1985). Each dot represents 1,000 acres.*



Figure 24.— *Number of campsites by county, East Texas, 1985 (TPWD 1985). Each dot represents 20 sites.*

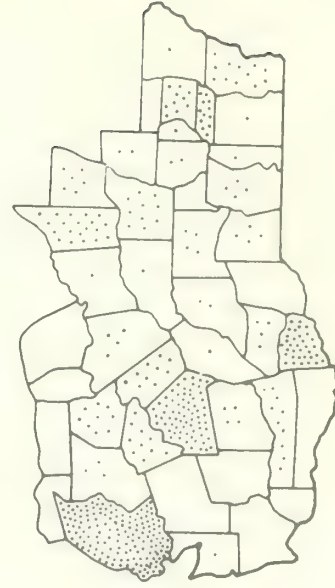


Figure 25.— *Yards of freshwater piers, marinas, and boat launch structures by county, East Texas, 1985 (TPWD 1985). Each dot represents 50 yards.*

retain the option for wood production while enhancing aesthetics and other nontimber values when harvesting timber and to consider wood production when managing forest resources for nontimber uses. Byproducts of timber management—temporary clearcut areas, regenerating sapling stands, and older even-aged stands of various age classes—provide visual variety in the landscape. Proper landscape design, particularly important along well-traveled roadways, near populated areas, in heavily-used recreation areas, and in sparsely forested agricultural areas, can mitigate timber and nontimber losses while enhancing aesthetic benefits. Guidelines to managing forests for timber as well as aesthetic benefits are available (Crowe 1973, Duffield 1970, Stern 1985).

More specifically, studies (Vodak and others 1985) have suggested that scenic quality is reduced in forested areas when slash or vegetative debris (discarded plant materials associated with wood harvests) is present. Forest recreation users dislike logging activity; those interested in opportunities for “primitive recreation” (i.e., being isolated from sights and sounds of man) are especially sensitive (Rudis 1987). Another study (Rudis and others, 1988) suggests that small amounts of

vegetative debris may not be viewed negatively if the debris does not inhibit visual penetration into the forest scene. Harvesting and management activities associated with timber production have occurred on nearly half of East Texas timberland, 5,500,000 acres, since the 1975 survey. One might anticipate that vegetative debris is not uncommon in these areas. However, “abundant” vegetative debris (a relative judgment, not quantified) occurs on only 19 percent of harvested or managed acres (1,100,000 out of 5,500,000 acres). The remaining acreage with “not abundant” vegetative debris occurs on 43 percent (2,400,000 acres). Acreage with no vegetative debris occurs on 38 percent (2,100,000 acres).

For all of East Texas, vegetative debris occurs on 34 percent of the timberland (3,900,000 out of 11,565,300 acres), 88 percent of which occurs on acres with commercial timber harvesting or timber management activities. The remaining 12 percent is associated with noncommercial activities, such as cutting for firewood, posts, etc. Vegetative debris is well-distributed, although it is less frequently encountered in southern and western portions (fig. 26). Adjacent nontimber influences (cropland uses and livestock grazing in the west, urban and built-up land in the south) and reduced

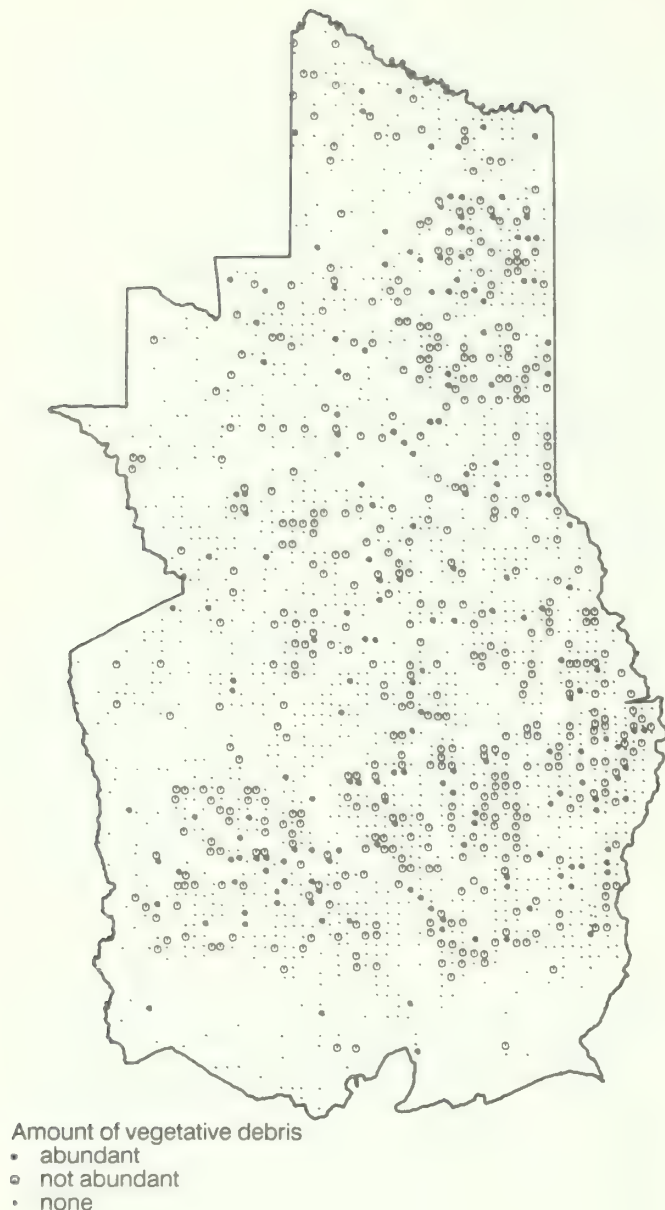


Figure 26.— *Timberland by amount of vegetative debris, East Texas, 1986.*

pine acreage (oak-hickory forest type in the west and bottomland hardwood forest types in the south) may affect timber harvesting and management practices in these areas.

Other discarded materials associated with human use can detract from the enjoyment of forests. Old bottles and rusted cans are especially disliked by forest users (Rudis 1987). Litter occurs on 34 percent of East Texas's timberland. Garbage dumping occurs on 5 percent of the acreage, beverage and food containers occur on an additional 23 percent, and other materials (miscellaneous bottles and cans, discarded machinery) adds another 6 percent. Much of the debris is found near roads, water sources, and areas with

other evidence of human activities (e.g., hunting, farming, mineral exploration and extraction).

Fire

Sawtimber stands that have had low-intensity fires can be more scenic than those where understories are unmanaged and crowded with foliage. Prescribed fires aid timber management of southern pine stands by reducing competition from competing hardwoods, disposing of logging debris, and assisting in site preparation. In young or recently thinned stands, fire also aids growth of grasses and forbs useful to livestock and selected game species prior to canopy closure. Fire also is recognized as a natural process that helps maintain the health of southern pine ecosystems, particularly the longleaf pine climax forest type. In older pine stands, periodic fires help prevent hardwoods from encroaching on otherwise suitable red-cockaded woodpecker nesting habitat.

Estimates of the acreage on which evidence of fire—natural or man-caused—is noted for the East Texas survey. Acreage with evidence of fire since the prior survey amounts to 2,000,000 acres, or 18 percent of the timberland. On an annual basis, this is about 200,000 acres, mostly in the loblolly-shortleaf pine forest type (table 15). Evidence of fire is more frequent in nonstocked, sapling, and seedling stands due to the use of fire in site preparation (i.e., removing logging debris prior to planting, soil scarification prior to seeding). The longleaf-slash forest type, a fire-dependent type in many areas, is associated with fire more than other types in all stand size classes (table 16). Evidence of fire is common mainly in the south central portion of the region where longleaf, slash and other pine stands predominate (fig. 27).

In future surveys, trends in the presence of logging debris, discarded materials, and evidence of fire are likely to be important in describing changes in forest management activities to remove logging debris and litter, and to prevent or prescribe fires in forested areas.

OUTLOOK

Examination of projections involving timber resource supplies in the South and alternative timber management and public policy options is in its infancy regarding the other forest values (Joyce and others 1986). Results-to-date suggest wildlife and other forest values are less affected by changes in wood production than by changes in timberland acreage (Flather and others, in process). Reforestation programs designed for wood production will ultimately conserve a number of other forest resources, especially if these programs

Table 15—Area and proportion of timberland with evidence of fire by forest type and time of fire, East Texas, 1986

Forest type	Proportion with evidence of fire ²	Since prior survey			
		Total	Within 2 years	Between 3 years and prior survey	None since prior survey
	<i>Percent</i>	<i>Thousand acres</i>			
Longleaf-slash	60	166.9	35.8	131.1	113.0
Loblolly-shortleaf	24	963.2	235.5	727.7	2,973.5
Oak-pine	20	486.8	134.6	352.2	1,915.0
Oak-hickory	11	386.2	154.2	232.0	2,983.1
Bottomland hardwoods ¹	1	23.6	11.4	12.2	1,554.0
All types	18	2,026.7	571.5	1,455.2	9,538.6

¹Includes oak-gum-cypress and elm-ash-cottonwood forest types.

²Since prior survey.

Table 16—Area and percent of timberland with evidence of fire since the prior survey by forest type and stand-size class, East Texas, 1986¹

Forest type	Stand-size class					
	Nonstocked, sapling, and seedling		Poletimber		Sawtimber	
	Thousand acres	Percent	Thousand acres	Percent	Thousand acres	Percent
Longleaf-slash	45.1	80	62.5	49	59.3	62
Loblolly-shortleaf	281.5	34	108.7	16	573.0	23
Oak-pine	296.8	42	36.4	8	152.4	12
Oak-hickory	282.5	23	43.0	4	61.8	6
Bottomland hardwoods ²	23.6	11	...	...	...	...
All forest types	929.5	31	250.7	9	846.5	15

¹Columns may not sum to totals due to rounding.

²Includes oak-gum-cypress and elm-ash-cottonwood forest types.

have other environmental objectives (e.g., planting some of the trees to promote wildlife, retain soil, and improve water quality). Integration of economically valued nontimber opportunities with timber management or more favorable economic conditions for hardwood sawtimber production also will favor selected nontimber resources.

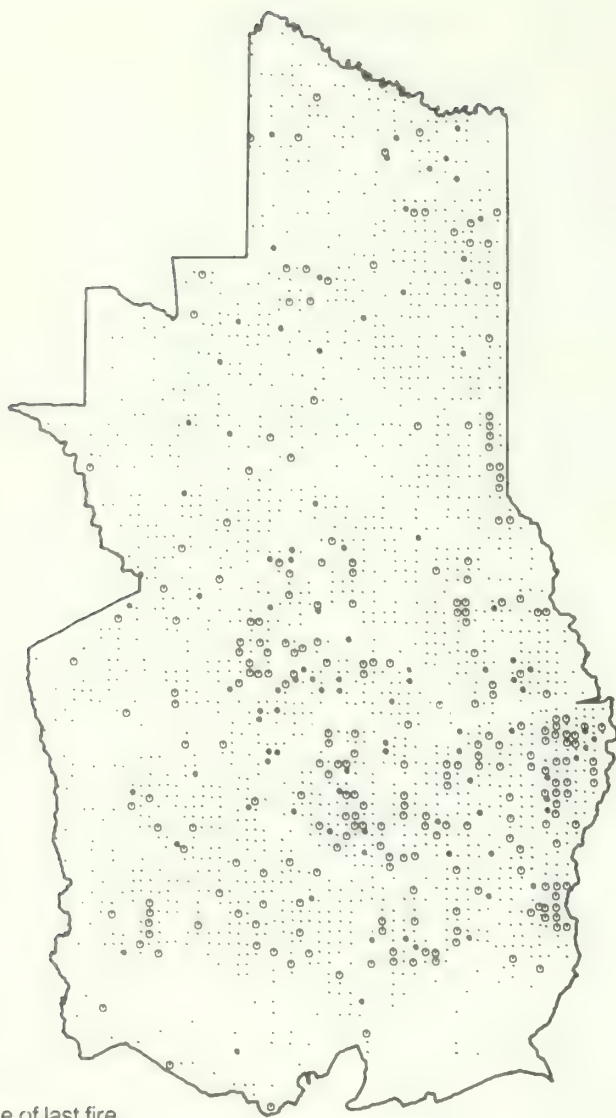
Regionally, the south central portion (Polk and surrounding counties) of East Texas contains fewer mast hardwoods than elsewhere in the region. Forest industries have owned and continue to retain a significant portion of the timberland in this area. Some of these lands are made available to the public for hunting and other nontimber pursuits. Such areas likely support wildlife species that favor younger-aged stands. As these stands mature to sawtimber stand size class, wildlife species in need of older-aged stands will be favored.

The outlook for red-cockaded woodpecker nesting habitat is uncertain. An assessment based on the 1975 survey (Lennartz and others 1983b) is not comparable, as age class determination varied

between surveys. Even if consideration is given to simplifying assumptions about stand age, statistical uncertainty for such a rare habitat is so large that significant trends in acreage cannot be detected. A large proportion of potential nesting habitat for red-cockaded woodpeckers is restricted to public forest acreage that will likely grow in importance for this endangered species.

Most information on the red-cockaded woodpecker has been limited to colonies on public land (Lennartz and others 1983a). Previously active colony populations on National Forests in Texas are declining (Richard Conner, personal communication, June 1987). However, comprehensive surveys of red-cockaded individuals forming new colonies on public land have not been done and the existence of new or expanding colonies on private land is not well known.

According to the Texas Parks and Wildlife Department (1985), demand for recreation facilities is likely to increase most in the Tyler and Lufkin/Nacogdoches district. Nearby suburban



Time of last fire
 • within 2 years
 ○ between 3 years and prior survey
 • none since prior survey

Figure 27.— *Timberland by time of last fire, East Texas, 1986.*

and urban populations outside East Texas have been expanding rapidly as well, increasing the nonresident demand for nonforest land uses, such as vacation homes and developed forest recreation facilities. An increase in road development on remaining timberland, and a reduction in remote timberland areas are anticipated with an increasing population, which suggests declines in primitive recreation opportunities (Cordell and Hendee 1982). Adequate planning for multiple uses is needed in those areas subject to urban influences if multiple value of timberland is to be retained.

The outlook for increasing East Texas' non-timber values is uncertain. There has been an increase in productive-reserved forest lands since

the 1975 survey. (The current acreage, 119,726 acres, is represented by the Big Thicket National Preserve [84,550 acres] and the designated wilderness areas of the National Forests [35,176 acres]). With the addition of the Big Thicket, productive-reserved forest land has more than doubled since the last survey. While such a rate of increase is unlikely in the future, one should expect some additional emphasis on nontimber values with the growth of the region's population. Despite the limited extent of public timberland (7 percent of the acreage), public timberland is likely to provide more of the multiple values in the future.

In order to maintain or augment the bulk of nontimber values of timberland, efforts may need to concentrate on the largest class of timberland owners—the nonindustrial private sector. Studies have suggested that nonindustrial private landowners motivated to sell timber are primarily interested in the income-generating potential of timberland (Hickman 1984). Those not motivated to sell timber may need to be convinced that certain timber production alternatives can promote other values important to them (Young and Reichenbach 1987), such as nontimber commodity values (livestock production, recreation leases) and noncommodity values (aesthetics, opportunities for viewing wildlife, personal recreation by landowners and friends).

Near urban areas, development of markets for small-scale specialty products, such as longleaf pine straw mulch (Gormley 1987), nongrowing stock firewood for domestic use, and Spanish moss, may help supplement private landowner income while retaining nontimber as well as timber value options. Where markets for lease hunting exist, the economics of accommodating game species (such as reserving mast hardwoods along streams) can be more profitable than timberland management focused on timber alone (McKee 1987). However, short-term economic incentives for developing multiple resource opportunities through hunting and grazing leases, or recreation user fees, may be relatively limited (Fedkiw 1986).

Any extensive effort to increase the other forest values on timberland requires individuals, groups, and programs that can recognize both the short-term income-generating opportunities as well as the long-term multiple value opportunities of timberland in East Texas.

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Appendix

Survey Methods

Forest resource statistics were secured by a systematic sampling method involving forest-nonforest classification on aerial photographs and on-the-ground measurement of trees at selected locations. The locations selected were at intersections of a grid of lines spaced 3 miles apart.

Initial estimates of forest area were obtained by interpreting 95,640 photopoints using dot counts and the most recent aerial photography available. The dot counts provided an estimate of the proportion of forest to nonforest that was used along with U.S. Census land area data to develop county-level forest area statistics. The photointerpretation estimate was then adjusted by ground

checks of all locations on the 3-mile grid, as well as intensification plots located between plots sampled.

Measurements included the collection of additional data on site productivity, stand origin, stand age, size of forest tract, distance from road, slope, aspect, management, evidence of use, proximity to nonforest land uses and other attributes. Ownership information was obtained for each plot from county tax assessors' records and contact with owners in the field. Personnel from the Agricultural Stabilization and Conservation Service and Soil Conservation Service, and other contacts were consulted when classifying absentee owners as farmers, individuals, corporations, or lessors.

Tree statistics were estimated from measurements taken at each forested location. Samples consist of 10 permanent horizontal points at each forested location. At each point, trees 5.0-inches d.b.h. or greater are tallied using a 37.5 factor prism, thus each tree represents 3.75 square feet of basal area per acre. Trees less than 5.0-inches d.b.h. are tallied on a 1/275 acre circular fixed plot on the first 3 points. Pine seedlings are tallied on a 1/1000 acre plot established at each of the 10 points. Growing-stock volume of trees was obtained using deterministic measurements, as described in Resource Bulletin SO-136 (McWilliams and Lord 1988).

Reliability of the Data

Reliability of FIA estimates may be affected by two sources of error. The first source, termed estimating error, arises from mistakes in measurement, judgement, recording, or compiling, and from limitations of the equipment. Estimating error is minimized by FIA through comprehensive training, good supervision, quality control programs, and emphasis on careful work.

A second source of error, called sampling error, is the statistical error associated with FIA's sample-based estimation procedures. Sampling errors are commonly referred to as percentages and are based on 1 standard deviation. That is, the chances are 2 out of 3 that if the results of a complete enumeration were known, the sample-based estimates would have been within the limits indicated. The FIA sample scheme has the objective of providing forest area and volume estimates of 1 percent per million acres and 5 percent per billion cubic feet, respectively, for the Pineywoods of Texas.

Sampling errors increase as estimates are broken down below the State-level, say by forest type and stand size. The relationship between sampling error and the degree of disaggregation is depicted in table A1.

Table A1.—*Sampling error to which estimates are liable, two chances out of three, East Texas, 1986*

Sampling error	Timberland area	Growing-stock volume
Percent	Thousand acres	Million cubic feet
0.3	11,565.3	.....
1.0	1,040.9	.....
2.0	260.2	11,233.2
3.0	115.6	4,992.5
4.0	65.1	2,808.3
5.0	41.6	1,797.3
10.0	10.4	449.3
15.0	4.6	199.7
20.0	2.6	112.3
25.0	1.7	71.9

DEFINITION OF TERMS

Agricultural Land—Agricultural land is land used primarily for the production of crops or live-stock. Included in proximity (nontimber) estimates are areas 10 acres or more in size such as cropland and pasture, nurseries, vineyards, orchards, confined feeding areas, and horse farms.

Basal Area—The area in square feet of the cross section at breast height of a single tree or of all the trees in a stand, usually expressed in square feet per acre.

D.b.h. (diameter at breast height)—Tree diameter in inches, outside bark, usually measured at 4½ feet above ground.

Diameter Classes—The 2-inch diameter classes extend from 1.0 inch below to 0.9 inches above the stated midpoint. Thus, the 12-inch class includes trees 11.0 inches through 12.9 inches d.b.h.

Dimension Classes of Trees

Sawtimber Trees—Trees 9.0 inches and larger in d.b.h. for softwoods, and 11.0 inches and larger for hardwoods.

Poletimber Trees—Trees 5.0 to 8.9 inches in d.b.h. for softwoods and 5.0 to 10.9 inches d.b.h. for hardwoods.

Saplings—Trees 1.0 inch to 4.9 inches in d.b.h.

Seedlings—Trees that are less than 1.0 inch in d.b.h.

Rough, Rotten, and Salvable Dead Trees—See “tree classes.”

Forest Land Classes

Forest Land—Land at least 16.7 percent stocked by forest trees of any size, or formerly having such tree cover, and not currently developed for nonforest uses. Minimum area considered for

classification is 1 acre. Forest land is divided into commercial categories: timberland, deferred timberland; and noncommercial categories: productive-reserved forest land, unproductive forest land.

Timberland—Forest land that is producing, or is capable of producing, crops of industrial wood and not withdrawn from timber utilization. Timberland is synonymous with “commercial forest land” in prior reports.

Deferred Timberland—National forest land that meets productivity standards for timberland but is under study for possible inclusion in the wilderness system.

Productive-Reserved Forest Land—Productive public forest land withdrawn from timber utilization through statute of administrative regulations.

Unproductive Forest Land—Forest land incapable of yielding crops of industrial wood because of adverse site conditions.

Forest Types

Longleaf-Slash Pine—Forests in which longleaf or slash pine, singly or in combination, comprise a plurality of the stocking. Common associates include oak, hickory, and gum.

Loblolly-Shortleaf Pine—Forests in which loblolly, shortleaf, Virginia, spruce pine and eastern redcedar, singly or in combination, comprise a plurality of the stocking. Common associates include oak, hickory, and gum.

Oak-Pine—Forests in which hardwoods (usually upland oaks) comprise a plurality of the stocking, but in which softwoods, except cypress, comprise 25-49 percent of the stocking. Common associates include gum, hickory, and yellow-poplar.

Oak-Hickory—Forests in which upland oaks or hickory, singly or in combination, comprise a plurality of the stocking except where pines comprise 25-49 percent, in which case the stand would be classified oak-pine. Common associates include yellow-poplar, elm, maple, and black walnut.

Oak-Gum-Cypress—Bottomland forests in which tupelo, blackgum, sweetgum, oaks, or cypress, singly or in combination, comprise a plurality of the stocking except where pines comprise 25-49 percent, in which case the stand would be classified oak-pine. Common associates include cottonwood, willow, ash, elm, hackberry, and maple.

Elm-Ash-Cottonwood—Forests in which elm, ash, or cottonwood, singly or in combination, comprise a plurality of the stocking. Common associates include willow, sycamore, beech, and maple.

FIA—Forest Inventory and Analysis unit of the U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station.

Mortality—Number or sound-wood volume of live trees dying from natural causes during a specified period.

Permanent Water Sources—Bodies of water or water courses present throughout the year. Included in proximity (nontimber) estimates are bodies of water 1/8 acre in size or larger, or water courses 40 feet or more in width.

Plantations—Timberland classified as longleaf-slash or loblolly-shortleaf forest types with evidence of planting or direct seeding.

Site Classes—A classification of forest land in terms of potential capacity to grow crops of industrial wood.

Stand-Size Classes

Sawtimber Stands—Stands at least 16.7 percent stocked with growing-stock trees, half or more of this stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber Stands—Stands at least 16.7 percent stocked with growing-stock trees, half or more of this stocking in sawtimber or poletimber trees, and with poletimber stocking exceeding that of sawtimber stocking.

Sapling-Seedling Stands—Stands at least 16.7 percent stocked with growing-stock trees, more than half of this stocking in saplings or seedlings.

Nonstocked Stands—Stands less than 16.7 percent stocked with growing-stock trees.

Stocking

Stocking is a measure of the extent to which the growth potential of the site is utilized by trees or preempted by vegetative cover. Stocking is determined by comparing the stand density in terms of number of trees or basal area with a specified standard. Therefore, full stocking is 100 percent of the stocking standard.

The tabulation below shows the density standard in terms of trees per acre by size class, required for full stocking.

D.b.h. (inches)	Number of trees	D.b.h. (inches)	Number of trees
Seedlings	600	16	72
2	560	18	60
4	460	20	51
6	340	22	42
8	240	24	36
10	155	26	31
12	115	28	27
14	90	30	24

Tree Classes

Commercial Species—Tree species currently or prospectively suitable for industrial wood products. Excluded are noncommercial species (see Species List).

Noncommercial Species—Tree species of typical small size, poor form, or inferior quality that normally do not develop into trees suitable for industrial wood products (see List of Species).

Growing-Stock Trees—Live trees of commercial species classified as sawtimber, poletimber, sapling, and seedling. Trees must have a 12-foot butt log now or prospectively to be classed as growing stock.

Rough Trees—Live trees of commercial species that are unmerchantable for saw logs currently or potentially because of roughness or poor form in the butt log. Also included are all live trees of noncommercial species.

Rotten Trees—Live trees of commercial species that are unmerchantable for saw logs currently or potentially because of rot deduction in the butt log.

Cull Trees—Rough or rotten trees.

Hardwoods—Dicotyledonous trees, usually broad-leaved and deciduous.

Softwoods—Coniferous trees, usually evergreen having needle or scalelike leaves.

Live Trees—All trees that are alive. Included are all size classes and all tree classes.

Salvable Dead Trees—Standing or down dead trees that were formerly growing stock and are considered merchantable.

Urban or Built-Up Land—Urban or built-up land is land comprised of areas of intensive human use with much of the land covered by man-made structures. Included in proximity (nontimber) estimates are areas 10 acres or more in size, such as towns, villages, strip developments along highways, power and communication facilities, industrial complexes, and institutions.

Volume

Volume of Cull—The volume of sound wood in the bole of rough and rotten trees.

Volume of Growing Stock—Volume of sound wood in the bole of sawtimber and poletimber trees from a 1-foot stump to a minimum 4.0-inch top outside bark or to the point where the central stem breaks into limbs. Rough, rotten, and non-commercial trees are excluded.

Volume of Sawtimber—Net volume of the saw-log portion of live sawtimber trees in cubic feet or board feet of the International rule (1/4-inch kerf). Net volume equals gross volume less deductions

for rot, sweep, and other defects that affect use for lumber to the point where the central stem breaks into limbs. Rough, rotten, and noncommercial trees are excluded.

Volume of Timber—The volume of sound wood in the bole of growing stock, rough, rotten, and salvable dead trees 5.0 inches and larger in d.b.h. from stump to a minimum 4.0-inch top outside bark, or to the point where the central stem breaks into limbs.

LIST OF SPECIES

Table A2 ranks all live trees (1.0 inches d.b.h. and larger) by relative importance and presents data on occurrence, relative importance, frequency, density, and basal area. The timber report (McWilliams and Lord 1988) ranks species by survey unit and volume for all live trees and provides maps of the county volume distribution of selected species.

Scientific and common names of tree species that were recorded on plots sampled in East Texas:¹

Genus and Species

Common Name

Softwoods

<i>Juniperus silicicola</i>	southern redcedar
<i>J. virginiana</i>	eastern redcedar
<i>Pinus echinata</i>	shortleaf pine
<i>P. elliotii</i>	slash pine
<i>P. palustris</i>	longleaf pine
<i>P. taeda</i>	loblolly pine
<i>P. virginiana</i>	Virginia pine
<i>Taxodium distichum</i> var. <i>distichum</i>	baldecypress

Hardwoods

<i>Acer barbatum</i>	Florida maple
<i>A. negundo</i>	boxelder
<i>A. rubrum</i> var. <i>rubrum</i>	red maple
<i>A. saccharinum</i>	silver maple
<i>A. saccharum</i>	sugar maple
<i>Aesculus glabra</i>	Ohio buckeye
<i>A. sp.</i> ²	buckeye
<i>Betula nigra</i>	river birch
<i>Bumelia sp.</i> ²	bumelia
<i>Carpinus caroliniana</i> ²	bluebeech
<i>Carya sp.</i> ²	hickory
<i>C. aquatica</i>	water hickory
<i>C. illinoensis</i>	pecan
<i>Castanea sp.</i> ²	chinkapin
<i>C. pumila</i>	Allegheny chinkapin

<i>Catalpa sp.</i>	catalpa
<i>Celtis laevigata</i>	sugarberry
<i>C. occidentalis</i>	hackberry
<i>Cercis canadensis</i> ²	eastern redbud
<i>Cornus florida</i>	flowering dogwood
<i>Crataegus sp.</i> ²	hawthorn
<i>Diospyros virginiana</i>	common persimmon
<i>Fagus grandifolia</i>	American beech
<i>Fraxinus americana</i>	white ash
<i>F. pennsylvanica</i>	green ash
<i>F. profunda</i>	pumpkin ash
<i>Gleditsia aquatica</i>	water locust
<i>G. triacanthos</i>	honey locust
<i>Ilex opaca</i>	American holly
<i>Juglans nigra</i>	black walnut
<i>Liquidambar styraciflua</i>	sweetgum
<i>Maclura pomifera</i>	Osage-orange
<i>Magnolia acuminata</i>	cucumbertree
<i>M. grandiflora</i>	southern magnolia
<i>M. virginiana</i>	sweetbay
<i>Melia azedarach</i> ²	chinaberry
<i>Morus alba</i> ²	white mulberry
<i>M. rubra</i>	red mulberry
<i>Nyssa aquatica</i>	water tupelo
<i>N. sylvatica</i> var. <i>sylvatica</i>	blackgum
<i>N. sylvatica</i> var. <i>biflora</i>	swamp tupelo
<i>Ostrya virginiana</i> ²	ironwood
<i>Oxydendrum arboreum</i> ²	sourwood
<i>Persea borbonia</i>	redbay
<i>Planera aquatica</i> ²	water-elm
<i>Platanus occidentalis</i>	American sycamore
<i>Populus sp.</i>	cottonwood
<i>Prosopis sp.</i>	mesquite
<i>Prunus sp.</i> ²	cherries, plums
<i>P. serotina</i>	black cherry
<i>Quercus alba</i>	white oak
<i>Q. bicolor</i>	swamp white oak
<i>Q. coccinea</i>	scarlet oak
<i>Q. falcata</i> var. <i>falcata</i>	southern red oak
<i>Q. falcata</i> var. <i>pagodifolia</i>	cherrybark oak
<i>Q. incana</i> ²	bluejack oak
<i>Q. laurifolia</i>	laurel oak
<i>Q. lyrata</i>	overcup oak
<i>Q. marilandica</i> ²	blackjack oak
<i>Q. macrocarpa</i>	bur oak
<i>Q. michauxii</i>	swamp chestnut oak
<i>Q. muehlenbergii</i>	chinkapin oak
<i>Q. nigra</i>	water oak
<i>Q. nuttallii</i>	Nuttall oak
<i>Q. phellos</i>	willow oak
<i>Q. prinus</i>	chestnut oak
<i>Q. shumardii</i>	Shumard oak
<i>Q. stellata</i> var. <i>stellata</i>	post oak
<i>Q. velutina</i>	black oak
<i>Q. virginiana</i> ²	live oak
<i>Salix sp.</i>	willow
<i>Sassafras albidum</i>	sassafras

<i>Tilia americana</i>	American basswood
<i>Ulmus alata</i>	winged elm
<i>U. americana</i>	American elm
<i>U. crassifolia</i>	cedar elm
<i>U. pumila</i>	Siberian elm
<i>U. rubra</i>	slippery elm
<i>U. serotina</i>	September elm
<i>Vaccinium arboreum</i> ²	sparkleberry

¹Names according to: Little, Elbert L., Jr. Checklist of United States Trees (Native and Naturalized). 1978. U.S. Department of Agriculture, Agr. Handbook No. 541, 375 p.

²Noncommercial species.

Table A2.—Occurrence, average importance, and relative frequency, density, and basal area of all live trees 1.0 inches diameter at breast height or greater by species on timberland, East Texas, 1986

Species	Occurrence ¹	Average Importance ²	Relative		
			Frequency ³	Density ⁴	Basal area ⁵
			Percent		
Loblolly pine	65.3	19.8	10.2	20.6	28.7
Sweetgum	63.3	11.5	9.9	14.2	10.5
Shortleaf pine	38.5	7.9	6.0	6.3	11.3
Post oak	39.4	6.2	6.1	5.4	7.2
Water oak	36.0	4.6	5.6	3.4	4.9
Southern red oak	39.5	4.6	6.1	3.0	4.7
Winged elm	33.3	4.6	5.2	6.1	2.4
Blackgum	28.8	3.5	4.5	3.6	2.5
Hickory (a)	24.7	2.9	3.8	2.6	2.2
White oak	17.6	2.0	2.7	1.4	2.0
Willow oak	14.1	2.0	2.2	1.5	2.2
Red maple	15.6	1.8	2.4	2.0	1.1
Bluebeech	9.1	1.6	1.4	2.5	.9
Cherrybark oak	15.1	1.6	2.3	1.0	1.5
Flowering dogwood	12.7	1.6	2.0	2.2	.5
Hawthorn	11.8	1.6	1.8	2.4	.4
Green ash	9.6	1.4	1.5	1.6	1.1
Slash pine	4.4	1.4	.7	1.7	1.7
Blackjack oak	10.8	1.3	1.7	1.1	1.0
Sugarberry and hackberry	10.3	1.2	1.6	1.1	1.1
Ironwood	7.2	1.0	1.1	1.5	.5
American holly	7.9	1.0	1.2	1.3	.5
White ash	9.5	1.0	1.5	.9	.6
Sassafras	7.9	.9	1.2	1.2	.3
American elm	8.2	.9	1.3	.7	.6
Laurel oak	6.4	.8	1.0	.8	.8
Sparkleberry	5.8	.7	.9	1.0	.2
Overcup oak	5.4	.7	.8	.3	.9
Eastern and southern redcedar	5.0	.6	.8	.6	.5
Common persimmon	5.4	.6	.8	.7	.2
Cedar elm	3.7	.5	.6	.4	.6
Black oak	4.7	.5	.7	.4	.3
Sweetbay	2.8	.5	.4	.6	.3
Longleaf pine	3.6	.5	.6	.3	.6
Slippery elm	4.1	.5	.6	.5	.2
Bluejack oak	2.7	.4	.4	.5	.3
Water hickory	3.4	.4	.5	.3	.4
Red mulberry	3.9	.4	.6	.4	.2
Baldcypress	2.1	.3	.3	.2	.5
Redbay	2.5	.3	.4	.5	.1

Table A2.—Occurrence, average importance, and relative frequency, density, and basal area of all live trees 1.0 inches diameter at breast height or greater by species on timberland, East Texas, 1986
Continued

Species	Occurrence ¹	Average Importance ²	Relative		
			Frequency ³	Density ⁴	Basal area ⁵
			Percent		
Swamp chestnut oak	2.8	.3	.4	.1	.3
American beech	2.7	.3	.4	.1	.4
River birch	2.0	.3	.3	.2	.3
Black cherry	3.0	.3	.5	.2	.1
Plum and cherries except black cherry	2.0	.2	.3	.3	.1
Southern magnolia	2.5	.2	.4	.2	.2
Shumard oak	1.7	.2	.3	.2	.2
Water tupelo	.8	.2	.1	.2	.4
Eastern redbud	1.8	.2	.3	.3	.1
Honey locust	2.5	.2	.4	.1	.1
Water-elm	1.2	.2	.2	.2	.2
American sycamore	2.1	.2	.3	.1	.2
Willow	1.9	.2	.3	.1	.1
Osage-orange	1.0	.1	.2	.1	.1
Bumelia	1.3	.1	.2	.1	(b)
Florida maple	1.0	.1	.2	.1	.1
Pecan	1.1	.1	.2	(b)	.1
Black walnut	1.1	.1	.2	(b)	.1
Boxelder	.7	.1	.1	.1	(b)
American basswood	.7	.1	.1	.1	.1
Cottonwood	.4	.1	.1	(b)	.1
Nuttall oak	.7	.1	.1	(b)	.1
Water locust	.7	.1	.1	(b)	(b)
Chinkapin	.6	.1	.1	.1	(b)
Other species	(c)	(c)	(c)	.1	.1
Miscellaneous ⁶ with stems					
> =5 inches d.b.h.	2.0	.2	.3	.1	.1
Total	642.0	100.0	100.0	100.0	100.0

Columns may not sum to totals due to rounding.

¹Out of the estimated 11,565,300 acres (1,910 timberland plots weighted by the acres each plot represents).

²Sum of relative frequency + relative density + relative basal area and divided by 3.

³Occurrence times 100.0 and divided by 642.0.

⁴Out of the estimated 6,523 million live trees in East Texas, 1986.

⁵Out of the estimated 880 million square feet in East Texas, 1986.

⁶Includes tree-like shrubs (e.g. *Zanthoxylum* sp. [prickly-ash, toothache tree], *Ligustrum* sp. [privet], *Symplocos tinctoria* [sweetleaf], *Cyrilla* sp.), exotic and native tree species very rarely encountered in Midsouth forests (e.g. *Pyrus* sp. [pear], *Sapium* sp. [tallowtree]), and other stems of noncommercial hardwoods not recorded by species.

(a) Except pecan and water hickory.

(b) Less than 0.05 percent.

(c) Relative importance is less than 0.05 percent for other species in species list but not listed above. Occurrence per species is less than 0.35 percent.

Rudis, Victor A. Nontimber values of East Texas timberland. Resour. Bull. SO-139. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 1988. 34 p.

Principal findings of the 1986 survey of timberland in East Texas are presented and discussed in terms of nontimber values: water and soils, range, wildlife, recreation, and other value interactions.

Additional keywords: multiresource inventory, dead trees, snags, red-cockaded woodpecker habitat, tree species composition

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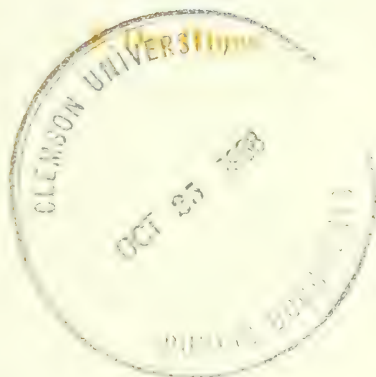
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Forest Statistics for Southwest Arkansas Counties - 1988



SUMMARY

The 1988 survey of the Southwest Unit of Arkansas shows the following trends since the 1978 survey.

- Timberland area now covers 6445.8 thousand acres, about the same as it was in 1978.
- Forest industry owns or leases 51 percent of the timberland, 3260.9 thousand acres. This is a 4-percent increase since 1978.
- Area covered by the loblolly-shortleaf and oak-pine forest types decreased by 1 and 2 percent respectively.
- Oak-hickory forest types showed a 22-percent increase in acreage.
- Bottomland hardwood forest types decreased by 180.4 thousand acres, 15 percent.
- Area in sawtimber stands remained relatively stable at 3330.5 thousand acres. Poletimber stands decreased 12 percent, sapling-seedling stands increased 14 percent.
- Plantation acreage is up 90 percent to 1147.0 thousand acres.
- Softwood volumes have decreased 5 percent for both growing stock and sawtimber.
- Hardwood volumes have increased; 5 percent for growing stock, 14 percent for sawtimber.
- Softwood growth decreased for growing stock and sawtimber.
- Softwood removals have increased and now exceed growth for both growing stock and sawtimber.
- Growth of hardwood growing stock decreased, while growth on hardwood sawtimber increased.
- Hardwood removals have increased for both growing stock and sawtimber.
- Mortality estimates are up.

FOREWORD

The Southern Forest Survey, an activity of the Southern Forest Experiment Station Forest Inventory and Analysis work unit, covers the States of Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, Tennessee, and East Texas, and the island of Puerto Rico.

This survey is part of the nationwide Forest Survey originally authorized by the McSweeney-McNary Act of 1928. More recent legislation pertinent to the survey mission includes the Forest and Rangeland Renewable Resources Planning Act of 1974 and the Forest and Rangeland Renewable Resources Research Act of 1978. The survey mission is to develop, analyze, and maintain renewable forest resource information. This information is essential for formulation of forest policies and programs.

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*Core tables are presented in response to the Southern Industrial Forestry Research Council's recommendations. These tables are identical among Forest Inventory and Analysis units in the eastern United States.



Figure I.—The forest survey regions of Arkansas.

Forest Statistics for Southwest Arkansas Counties — 1988

F. Dee Hines

INTRODUCTION

Tabulated results were derived from data obtained during a recent inventory of 20 counties comprising the Southwest Unit of Arkansas (fig. 1). Data on forest acreage and timber volume were secured by a three-step process. A forest-nonforest classification using aerial photographs was accomplished for points representing approximately 230 acres. These photo classifications were adjusted based on ground observations at sample locations representing approximately 3840 acres. Finally, field measurements were made at forest locations on the intersections of grid lines spaced 3 miles apart. At these forest locations, per-acre estimates were obtained from trees measured on ten 37.5 basal area factor prism points.

The sampling methods were designed to achieve suitable sampling errors for estimates of area and volume at the State level. Sampling error increases as the area or volume considered decreases. The sampling errors presented in table I, equal to one standard deviation for the sample data, may be used to construct confidence intervals for population parameters. For example, at the 95 percent confidence level, the confidence interval for growing-stock volume (in million cubic feet) in the Southwest Unit of Arkansas (with a sampling error of 2.3 percent) is

$$8321.8 \pm 1.96(0.023 \times 8321.8) = \\ 8321.8 \pm 375.1$$

where 1.96 is the number of standard deviations. This confidence interval indicates that the actual growing-stock volume lies in the range 7946.7 to 8696.9 million cubic feet, unless a 1 in 20 chance has occurred.

Sampling errors for sub-groups of counties in the unit may be estimated by the following formula:

$$SE_g = \frac{SE_t \sqrt{X_t}}{\sqrt{X_g}}$$

where:

SE = standard error of estimate
(expressed as a percent)

X = variable of interest
(area or volume)

g = group of counties to be combined
t = total for the unit.

For example, the sampling error estimate of growing-stock volume for Columbia and Union counties is 5.6 percent. Thus, the 95 percent confidence interval for growing-stock volume is 1397.6 ± 153.4 million cubic feet.

Ownership information is obtained by the same systematic sample outlined above. County courthouse records are used to obtain ownership information for each forested plot. An expansion factor representing timberland area in that county is then applied to the ownership group the plot represents. Next, the ownership groups are totaled for each county. Thus, acreages reported at the county level are estimates and may not exactly match known totals for each ownership category within that county.

In order to achieve greater compatibility among Forest Inventory and Analysis Projects, a new tree grading classification has been initiated for the 1988 Arkansas survey. Tree grade 5 is used for trees currently or prospectively capable of producing at least one 12-foot log or two 8-foot logs in the saw-log portion but not able to produce a 12-foot log in the butt 16 feet. These

Table I—Sampling errors¹ for timberland, growing stock, and sawtimber, Southwest Arkansas, 1988

County	Growing stock				Sawtimber volume
	Timberland	Volume	Growth	Removals	
	----- <i>Percent</i> -----				
Ashley	1.2	7.6	7.4	10.8	8.7
Bradley	1.2	7.1	7.3	11.3	8.6
Calhoun	1.7	9.4	8.9	15.7	10.9
Clark	1.8	8.3	9.5	10.8	9.7
Cleveland	0.8	11.1	10.2	11.3	9.4
Columbia	1.8	9.3	8.3	13.1	12.0
Dallas	2.0	8.5	6.5	12.6	10.6
Drew	2.4	6.9	7.6	8.6	8.3
Grant	0.9	11.4	9.1	13.4	13.7
Hempstead	2.0	11.1	13.9	20.9	14.2
Hot Spring	2.2	12.0	11.5	19.1	15.7
Howard	2.1	14.4	11.4	16.9	17.1
Lafayette	1.8	12.1	8.8	16.8	14.7
Little River	2.8	18.8	17.6	21.1	24.0
Miller	1.9	13.8	9.0	21.0	17.4
Nevada	1.4	9.1	8.0	14.2	11.2
Ouachita	1.7	8.2	7.7	13.2	10.0
Pike	1.9	12.8	12.6	15.7	15.1
Sevier	2.3	12.4	10.7	19.2	15.8
Union	1.0	6.4	6.2	10.1	7.7
All counties	0.4	2.3	2.1	3.2	2.7

¹By random-sampling formula.

trees, formerly classed as rough or rotten, are now included in growing stock. Table II shows the impact of this change on volume and growth.

For comparative purposes 1978 survey data were reprocessed using current procedures. Therefore, differences between 1978 and 1988 data should reflect resource changes and not data processing differences. Results from the reprocessed 1978 data are used for comparison to 1988 data in the Highlights that follow.

HIGHLIGHTS

Timberland Area

The Southwest Unit of Arkansas is the most heavily forested area in the State. Seventy-three percent of the area is forested. The total area of timberland, 6445.8 thousand acres, is essentially unchanged since the previous survey in 1978.

Forest industries have acquired 4 percent more timberland than they had in 1978 and now hold 3260.9 thousand acres. This acreage, 51 percent of the total, includes land under long-term lease. Other publicly owned land

jumped up 47 percent to 166.1 thousand acres, while other privately owned land lost 5 percent and is now at 3018.9 thousand acres.

Acreage covered by the various forest types has changed in southwest Arkansas since the previous survey. The largest change is the 22-percent increase in area covered by the oak-hickory forest type. Bottomland hardwood types, which include the oak-gum-cypress and elm-ash-cottonwood types, have dropped 180.4 thousand acres or about 15 percent. The loblolly-shortleaf and oak-pine forest types are relatively unchanged, down only 1 and 2 percent respectively.

The survey also shows some interesting differences in stand structure since 1978. Although the area of sawtimber stands remained relatively stable at 3330.5 thousand acres, area in poletimber stands decreased by 12 percent is now at 1473.0 thousand acres. Sapling-seedling stands increased by 14 percent. Much of the increase in sapling-seedling stand area can be accounted for by a 90-percent increase in plantation acreage. Plantations now cover 1147.0 thousand acres, almost 18 percent of the timberland in Southwest Arkansas.

Table II—Changes in volume and growth estimates due to inclusion of tree grade 5 in growing-stock inventory, Southwest Arkansas, 1988

	Tree grade 5		
	Excluded from growing stock	Included in growing stock	Percent change
----- Million cubic feet -----			
Softwood:			
Growing-stock volume	4664.3	4695.1	.7
Rough and rotten volume	118.0	87.3	-26.0
Growing-stock growth	272.7	275.5	1.0
Hardwood:			
Growing-stock volume	3436.2	3626.8	5.5
Rough and rotten volume	585.0	394.5	-32.6
Growing-stock growth	129.8	148.7	14.6
----- Million board feet -----			
Softwood:			
Sawtimber volume	20768.7	20884.3	.6
Sawtimber growth	1272.9	1282.7	.8
Hardwood:			
Sawtimber volume	10295.6	11026.8	7.1
Sawtimber growth	478.8	551.5	15.2

Number of Trees

The total number of live trees in the Southwest Unit of Arkansas has decreased by 17 percent. Both softwood and hardwood live tree numbers are down. Hardwood total live tree numbers are down 6 percent with all diameter classes below 18 inches showing losses. Similarly, diameter classes of softwood live trees below 18 inches also show decreases except for the 6-inch class where a small increase is seen. The total number of softwood trees decreased by 9 percent.

Growing-stock tree numbers have also decreased since the survey of 1978. The total is off by 31 percent. Softwood and hardwood totals are down by 19 and 38 percent respectively. In the softwoods, all diameter classes below 18 inches have decreased. Again, hardwood growing-stock trees have decreased in all diameter classes below 12 inches and in the 16-inch class. Most of the drop in growing-stock trees, both softwoods and hardwoods, was in the 4-inch class and below.

Timber Volume

Softwood volumes have decreased since the previous inventory. Softwood growing-stock volume decreased 5 percent and is now 4695.1 million cubic feet. This is different from the 17-percent increase between the 1968 and 1978 surveys. Sawtimber volume of softwoods shows the same pattern, decreasing 5 percent between 1978 and 1988 and increasing 22 percent between 1969 and 1978. Currently softwood sawtimber volume is 20884.3 million board feet.

Conversely, hardwood volumes show the opposite pattern for the current inventory. Both growing-stock and sawtimber volume have increased for the 1988 survey. Growing-stock volume is 3626.8 million cubic feet, a 5-percent increase. Similarly sawtimber is up 14 percent to 11026.8 million board feet. Total hardwood volumes were essentially the same between the 1968 and 1978 inventories.

Growth, Removals, and Mortality

Average net annual growth of growing stock is down for both softwoods and hardwoods. Softwood growing-stock growth, now at 275.5 million cubic feet annually, has decreased 11 percent since the 1978 estimate. Net annual growth of hardwood growing-stock volume is 148.7 million cubic feet. This represents a 4-percent decline.

Average net annual growth of sawtimber has decreased for softwoods, while hardwoods show an increase. Sawtimber growth of softwood is currently estimated at 1282.7 million board feet annually. This 11-percent decrease is contrasted by the 22-percent increase seen for hardwoods. Hardwood net annual growth on sawtimber is 551.5 million board feet.

The 1988 survey shows all removals to be above 1978 levels. Net annual removals of growing stock are up 35 percent for softwood and 7 percent for hardwood. Similarly, net annual removals of sawtimber are up 37 percent for softwoods and 15 percent for hardwoods. Softwood growing-stock removals are now 300.7 million cubic feet while softwood sawtimber removals are 1381.0 million board feet. Removals from hardwood growing stock are estimated at 135.3 million cubic feet. Sawtimber removals of hardwood are 416.4 million board feet.

Attention should be drawn to the fact that removals exceed growth for softwood growing stock and sawtimber situation could have an impact on future supplies in this area. However, the large increase in plantation acreage is encouraging.

Although hardwood growth of growing stock has decreased, growth is still greater than removals. However, as Table II indicates, without the inclusion of tree grade 5 trees in growing stock, hardwood removals of growing stock would exceed growth as in softwood growing-stock growth. Hardwood sawtimber shows a favorable growth-to-removal ratio with or without tree grade 5 trees.

Mortality totals for the Southwest Unit of Arkansas have increased. The current survey shows total mortality of growing stock at 56.1 million cubic feet annually. This is a 41-percent

increase over the previous level. Total sawtimber mortality has increased 30 percent to 143.4 million board feet annually.

Tables 1-25 were developed to provide comparability among Forest Inventory and Analysis Projects. Tables 26-35 are supplementary tables and may change from unit to unit or State to State to address specific resource issues.

DEFINITION OF TERMS

Average net annual growth.—Average net annual volume increase for the inter-survey period.

Average annual mortality.—Average annual sound-wood volume of growing-stock trees dying from natural causes.

Average annual removal.—Average net annual volume of growing-stock trees removed from the inventory by harvesting, cultural operations (such as timber-stand improvement), land clearing, or changes in land use.

Commercial species.—Tree species which normally develop into trees suitable for industrial wood products.

Forest type.—A classification of forest land based upon the species forming a plurality of live-tree stocking.

Growing-stock trees.—Live trees of commercial species. Rough and rotten trees are excluded.

Growing-stock volume.—The cubic-foot volume of sound wood in growing-stock trees at least 5.0 inches in diameter at breast height, from a 1-foot stump to a minimum 4.0-inch top diameter outside bark of the central stem, or to the point where the central stem breaks into limbs.

Live trees.—Commercial and noncommercial tree species of sapling size or larger.

Natural stands.—Stands with no evidence of artificial regeneration. This includes those established by seed tree regeneration methods.

Noncommercial species.—Tree species of typically small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products.

Planted stands.—Stands with some evidence of planting or direct seeding.

Poletimber trees.—Growing-stock trees at least 5.0 inches in diameter at breast height, but smaller than sawtimber size.

Reserved timberland.—Productive public forest land withdrawn from timber utilization through statute or administrative regulations.

Rotten trees.—Live trees of commercial species that do not contain at least one 12-foot log or two 8-foot logs in the saw-log portion, now or prospectively, primarily because of rot.

Rough trees.—Live trees of commercial species that do not contain at least one 12-foot log or two 8-foot logs in the saw-log portion, now or prospectively, primarily because of roughness or poor form. Also included are all live trees of noncommercial species.

Saplings.—Growing-stock trees at least 1.0 inches but less than 5.0 inches in diameter at breast height.

Sawtimber trees.—Live trees that contain at least one 12-foot log, or two 8-foot logs in the saw-log portion, and meet regional specifications for freedom from defect. Softwoods must be at least 9.0 inches in diameter at breast height and hardwoods at least 11.0 inches in diameter at breast height.

Sawtimber volume.—Sound-wood volume of the saw-log portion of growing-stock sawtimber trees in board feet, International 1/4-inch rule and in cubic feet.

Seedlings.—Growing-stock trees less than 1.0 inches in diameter at breast height and greater

than one foot tall for hardwoods, greater than six inches tall for softwoods, and greater than one-half inch in diameter at ground level for longleaf pine.

Select red oaks.—A classification of several red oak species composed of: cherrybark, Shumard, and northern red oaks.

Select white oaks.—A classification of several white oak species composed of: white, swamp chestnut, swamp white, chinkapin, Durand, and bur oaks.

Site class.—A classification of forest land in terms of inherent capacity to grow crops of industrial wood.

Stand-size class.—A classification of forest land based on the diameter class of growing-stock trees on the sampled area; that is, sawtimber, poletimber, or sapling and seedling.

Timberland.—Forest land that is producing, or is capable of producing, crops of industrial wood and not withdrawn from timber utilization. Timberland is synonymous with "commercial forest land" in prior reports.

Tree grade.—A classification of the volume of the saw-log portion of sawtimber trees, based on: 1) the log grade of the butt log, or 2) ability to produce at least one 12-foot or two 8-foot logs in the upper-section of the saw-log portion.

Woodland.—Forest land incapable of yielding crops of industrial wood because of adverse site conditions.

Table 1—Area by county and land class, Southwest Arkansas, 1988

County	All land ¹	Forest land			Reserved timberland	Nonforest land
		Total	Timberland ²	Woodland ³		
<i>----- Thousand acres -----</i>						
Ashley	597.5	377.4	377.4	...	...	220.1
Bradley	418.6	353.6	353.6	...	...	65.1
Calhoun	402.2	330.7	330.7	...	...	71.5
Clark	554.6	405.4	405.4	...	...	149.3
Cleveland	383.1	330.7	330.7	...	...	52.4
Columbia	490.9	381.5	381.5	...	...	109.5
Dallas	427.3	362.5	362.5	...	...	64.9
Drew	532.1	386.2	386.2	...	...	145.9
Grant	405.1	335.9	335.9	...	...	69.2
Hempstead	463.7	277.4	277.4	...	...	186.3
Hot Spring	393.6	276.9	276.9	...	...	116.7
Howard	367.1	250.7	250.7	...	...	116.4
Lafayette	331.3	224.4	224.4	...	...	106.8
Little River	330.1	166.9	166.9	...	...	163.3
Miller	396.2	170.1	170.1	...	...	226.1
Nevada	397.1	306.0	306.0	...	...	91.1
Ouachita	471.6	392.9	392.9	...	...	78.7
Pike	383.0	303.9	303.9	...	...	79.1
Sevier	358.5	227.9	227.9	...	...	130.7
Union	674.0	584.9	584.9	...	...	89.1
All counties	8777.9	6445.8	6445.8	...	...	2332.1

¹From U.S. Bureau of the Census.²Forest land (formerly termed commercial forest land) that is producing or capable of producing at least 20 cubic feet of industrial wood per acre per year. Includes areas which may be inaccessible or inoperable by current standards. Excludes reserved timberlands.³Forest land incapable of producing 20 cubic feet of industrial wood per acre per year under natural conditions because of adverse site conditions.**Table 2—Area of timberland by county and ownership class, Southwest Arkansas, 1988**

County	All ownerships	National forest	Misc. federal	State	County and municipal	Forest industry ¹	Farmer	Corporate ²	Individual ²
<i>----- Thousand acres -----</i>									
Ashley	377.4	...	10.9	...	...	273.5	21.9	5.5	65.6
Bradley	353.6	...	11.4	...	...	182.5	5.7	34.2	119.8
Calhoun	330.7	...	...	...	...	242.5	16.5	5.5	66.1
Clark	405.4	...	11.3	...	...	146.4	73.2	22.5	152.0
Cleveland	330.7	...	...	...	...	191.5	5.8	11.6	121.8
Columbia	381.5	...	...	...	...	90.8	12.1	24.2	254.3
Dallas	362.5	...	...	...	...	261.2	5.3	10.7	85.3
Drew	386.2	...	...	16.1	...	219.9	21.5	21.5	107.3
Grant	335.9	...	...	...	...	252.0	4.9	...	79.0
Hempstead	277.4	...	...	...	...	105.4	11.1	16.6	144.2
Hot Spring	276.9	...	...	...	...	163.6	...	6.3	107.0
Howard	250.7	...	5.2	...	...	161.9	62.7	...	20.9
Lafayette	224.4	...	...	...	...	82.7	29.5	...	112.2
Little River	166.9	...	...	...	...	73.0	52.1	5.2	36.5
Miller	170.1	...	...	17.0	...	28.4	39.7	5.7	79.4
Nevada	306.0	...	...	17.3	...	127.0	34.6	5.8	121.3
Ouachita	392.9	...	6.0	6.0	12.1	114.9	30.2	36.3	187.4
Pike	303.9	...	...	...	...	233.8	52.6	...	17.5
Sevier	227.9	...	9.7	...	...	111.5	33.9	14.5	58.2
Union	584.9	...	37.6	...	5.4	198.5	53.7	59.0	230.7
All counties	6445.8	...	92.1	56.5	17.5	3260.9	567.1	285.1	2166.6

¹Includes land leased to forest industry.²Indian land will be classed as corporate or individual as defined by the Bureau of Indian Affairs.

Table 3—Area of timberland by county and forest type group, Southwest Arkansas, 1988

County	Forest type group							Nontyped ¹
	Total	Loblolly-shortleaf pine		Oak-pine	Oak-hickory	Oak-gum-cypress	Elm-ash-cottonwood	
		Planted	Natural					
<i>Thousand acres</i>								
Ashley	377.4	...	213.3	65.6	43.8	54.7	...	...
Bradley	353.6	11.4	102.6	96.9	68.4	74.1	...	...
Calhoun	330.7	38.6	110.2	55.1	38.6	88.2	...	...
Clark	405.4	56.3	95.7	90.1	112.6	50.7	...	...
Cleveland	330.7	17.4	104.4	75.4	75.4	58.0	...	...
Columbia	381.5	24.2	127.2	84.8	84.8	60.6	...	...
Dallas	362.5	42.6	117.3	85.3	85.3	26.7	...	5.3
Drew	386.2	42.9	91.2	75.1	112.6	64.4	...	...
Grant	335.9	69.2	54.3	64.2	84.0	64.2	...	...
Hempstead	277.4	66.6	27.7	77.7	66.6	38.8	...	...
Hot Spring	276.9	50.3	31.5	81.8	75.5	37.8	...	...
Howard	250.7	78.3	26.1	67.9	52.2	26.1	...	...
Lafayette	224.4	17.7	76.8	35.4	47.2	47.2	...	...
Little River	166.9	36.5	36.5	26.1	41.7	20.9	5.2	...
Miller	170.1	11.3	39.7	22.7	62.4	34.0	...	...
Nevada	306.0	28.9	86.6	63.5	75.1	52.0	...	...
Ouachita	392.9	36.3	133.0	66.5	60.4	96.7	...	...
Pike	303.9	105.2	81.8	87.7	29.2	...	...	...
Sevier	227.9	29.1	33.9	33.9	87.3	43.6	...	...
Union	584.9	64.4	144.9	144.9	123.4	107.3	...	...
All counties	6445.8	827.3	1734.8	1400.6	1426.6	1046.0	5.2	5.3

¹Timberland with no current stocking.

Table 4—Area of timberland by county and stand-size class, Southwest Arkansas, 1988

County	All classes	Stand-size class		Sapling- seedling	Nonstocked ¹ areas
		Sawtimber	Poletimber		
----- <i>Thousand acres</i> -----					
Ashley	377.4	235.2	71.1	71.1	...
Bradley	353.6	256.6	57.0	34.2	5.7
Calhoun	330.7	176.4	66.1	88.2	...
Clark	405.4	185.8	112.6	101.3	5.6
Cleveland	330.7	237.9	52.2	40.6	...
Columbia	381.5	218.0	84.8	78.7	...
Dallas	362.5	186.6	69.3	95.9	10.7
Drew	386.2	209.2	69.7	101.9	5.4
Grant	335.9	138.3	108.7	84.0	4.9
Hempstead	277.4	127.6	94.3	55.5	...
Hot Spring	276.9	81.8	75.5	119.6	...
Howard	250.7	47.0	83.6	120.1	...
Lafayette	224.4	100.4	82.7	41.3	...
Little River	166.9	78.2	52.1	31.3	5.2
Miller	170.1	73.7	73.7	22.7	...
Nevada	306.0	207.9	46.2	46.2	5.8
Ouachita	392.9	229.7	66.5	90.7	6.0
Pike	303.9	105.2	52.6	146.1	...
Sevier	227.9	97.0	63.0	67.9	...
Union	584.9	338.1	91.2	144.9	10.7
All counties	6445.8	3330.5	1473.0	1582.2	60.1

¹Timberland less than 16.7 percent stocked.

Table 5—Area of timberland by county and site class, Southwest Arkansas, 1988

County	All classes	Site class (cubic feet/acre/year)				
		> 165	120-165	85-120	50-85	< 50
----- Thousand acres -----						
Ashley	377.4	16.4	114.9	191.4	49.2	5.5
Bradley	353.6	11.4	74.1	205.3	62.7	...
Calhoun	330.7	5.5	60.6	181.9	82.7	...
Clark	405.4	22.5	101.3	208.3	73.2	...
Cleveland	330.7	11.6	81.2	226.3	11.6	...
Columbia	381.5	48.4	78.7	181.7	72.7	...
Dallas	362.5	...	95.9	191.9	74.6	...
Drew	386.2	32.2	80.5	219.9	53.6	...
Grant	335.9	9.9	79.0	197.6	49.4	...
Hempstead	277.4	5.5	83.2	138.7	49.9	...
Hot Spring	276.9	6.3	31.5	88.1	81.8	69.2
Howard	250.7	...	20.9	151.5	78.3	...
Lafayette	224.4	...	23.6	118.1	65.0	17.7
Little River	166.9	5.2	41.7	83.4	31.3	5.2
Miller	170.1	...	45.4	79.4	39.7	5.7
Nevada	306.0	23.1	98.2	138.6	46.2	...
Ouachita	392.9	30.2	126.9	187.4	42.3	6.0
Pike	303.9	...	52.6	122.7	128.6	...
Sevier	227.9	33.9	67.9	67.9	53.3	4.8
Union	584.9	48.3	193.2	284.4	59.0	...
All counties	6445.8	310.6	1551.4	3264.5	1205.2	114.2

Table 6—Area of timberland by county and stocking classes of growing-stock trees, Southwest Arkansas, 1988

County	All classes	Stocking class (percent)				
		> 130	100-130	60-100	16.7-60	< 16.7
----- <i>Thousand acres</i> -----						
Ashley	377.4	10.9	54.7	235.2	76.6	...
Bradley	353.6	...	57.0	199.6	91.2	5.7
Calhoun	330.7	22.0	110.2	148.8	49.6	...
Clark	405.4	22.5	123.9	168.9	84.5	5.6
Cleveland	330.7	11.6	69.6	191.5	58.0	...
Columbia	381.5	24.2	115.1	181.7	60.6	...
Dallas	362.5	...	111.9	197.2	42.6	10.7
Drew	386.2	...	96.5	166.3	118.0	5.4
Grant	335.9	39.5	69.2	153.1	69.2	4.9
Hempstead	277.4	22.2	44.4	160.9	49.9	...
Hot Spring	276.9	6.3	62.9	163.6	44.1	...
Howard	250.7	5.2	57.4	135.8	52.2	...
Lafayette	224.4	5.9	94.5	94.5	29.5	...
Little River	166.9	10.4	10.4	93.9	46.9	5.2
Miller	170.1	...	22.7	113.4	34.0	...
Nevada	306.0	11.5	86.6	144.4	57.7	5.8
Ouachita	392.9	6.0	114.9	223.7	42.3	6.0
Pike	303.9	11.7	46.8	192.9	52.6	...
Sevier	227.9	4.8	33.9	121.2	67.9	...
Union	584.9	26.8	193.2	279.0	75.1	10.7
All counties	6445.8	241.9	1575.9	3365.4	1202.6	60.1

Table 7—Area of timberland by forest type and ownership class, Southwest Arkansas, 1988

Forest type ¹	All ownerships	National forest	Other public	Forest industry	Forest industry- leased	Other private
----- Thousand acres -----						
Loblolly-shortleaf pine	2562.1	...	32.5	1539.4	6.1	984.1
Softwood total	2562.1	...	32.5	1539.4	6.1	984.1
Oak-pine	1400.6	...	22.9	676.7	...	701.0
Oak-hickory	1426.6	...	17.0	547.5	...	862.0
Oak-gum-cypress	1046.0	...	93.6	479.8	6.1	466.5
Elm-ash-cottonwood	5.2	...	...	...	...	5.2
Hardwood total	3878.4	...	133.6	1704.0	6.1	2034.8
Nontyped ²	5.3	...	...	5.3	...	...
All types	6445.8	...	166.1	3248.8	12.1	3018.9

¹Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

²Timberland with no current stocking.

Table 8—Area of timberland by ownership and stocking classes of growing-stock trees, Southwest Arkansas, 1988

Ownership class	All classes	Stocking class (percent)				
		> 130	100-130	60-100	16.7-60	< 16.7
----- <i>Thousand acres</i> -----						
Other public	166.1	...	38.4	99.5	28.2	...
Forest industry	3248.8	134.6	824.5	1647.1	621.5	21.1
Forest industry-leased	12.1	...	...	12.1	...	...
Other private	3018.9	107.2	713.0	1606.8	552.9	38.9
All ownerships	6445.8	241.9	1575.9	3365.4	1202.6	60.1

Table 9—Area of timberland by forest type and stand-size class, Southwest Arkansas, 1988

Forest type ¹	Stand-size class				Nonstocked ² areas
	All classes	Sawtimber	Poletimber	Sapling- seedling	
----- <i>Thousand acres</i> -----					
Loblolly-shortleaf pine	2562.1	1354.7	565.5	641.8	...
Softwood total	2562.1	1354.7	565.5	641.8	...
Oak-pine	1400.6	709.9	279.9	405.1	5.7
Oak-hickory	1426.6	554.7	425.2	429.9	16.7
Oak-gum-cypress	1046.0	711.1	197.2	105.3	32.3
Elm-ash-cottonwood	5.2	...	5.2	...	...
Hardwood total	3878.4	1975.7	907.5	940.4	54.7
Nontyped ³	5.3	...	...	...	5.3
All types	6445.8	3330.5	1473.0	1582.2	60.1

¹Forest type is based on species plurality of all live trees. Mixed types that in combination contain a majority of hardwood stocking are hardwood types.

²Timberland less than 16.7 percent stocked.

³Timberland with no current stocking.

Table 10—Number of live trees on timberland by species and diameter class, Southwest Arkansas, 1988

Species	Diameter class (inches at breast height)												
	All classes	1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 & larger
----- Thousand trees -----													
Shortleaf-loblolly pine	1178346	531337	275363	142900	88754	48787	35483	25133	14281	8250	4309	3661	86
Cypress	7730	2472	984	1094	1011	561	401	461	274	199	68	175	30
Other softwoods	21636	15398	3927	1390	725	143	54	...	...	...	...	...	...
Total softwoods	1207713	549208	280274	145385	90489	49491	35938	25594	14556	8449	4377	3835	117
Select white oaks	182651	106390	40430	11760	9193	5802	3417	2531	1167	798	566	560	38
Select red oaks	55423	29924	11429	3636	3356	2067	1680	868	757	475	449	685	96
Other white oaks	117477	52705	26325	14056	9174	6619	3454	2138	1202	747	379	589	90
Other red oaks	346510	215512	52031	24209	17005	13480	8562	5753	3894	2446	1569	1865	184
Hickory	181125	120421	27890	14243	7962	3646	3066	1785	945	641	230	283	13
Hard maple	1761	1064	444	93	147	...	...	...	...	13	...	...	...
Soft maple	278254	229531	32691	9114	3887	1672	565	377	265	68	29	46	9
Beech	7691	3540	2105	108	341	436	225	234	101	201	106	210	83
Sweetgum	725059	489554	125367	52352	25597	14441	7533	4744	2733	1449	723	526	40
Tupelo-blackgum	196115	146280	29627	10158	3506	2861	1615	931	519	253	183	164	17
Ash	94667	67330	14616	6559	2827	1621	814	383	291	98	41	88	...
Cottonwood-aspen	1253	478	492	77	...	32	...	67	41	11	9	41	4
Basswood	613	516	...	...	...	37	25	15	...	...	...	20	...
Black walnut	1255	953	...	204	...	97	...	...	...	...	...	...	...
Other hardwoods	633190	494882	93607	23033	10262	5500	2556	1685	576	435	345	264	45
Total hardwoods	2823045	1959081	457056	169602	93257	58310	33512	21510	12491	7636	4628	5341	620
Noncommercial	422961	339617	58526	18133	4554	1514	376	141	28	63	9	...	...
All species	4453718	2847906	795856	333120	188300	109315	69825	47245	27076	16148	9015	9177	736

Table 11—Number of growing-stock trees on timberland by species and diameter class, Southwest Arkansas, 1988

Species	Diameter class (inches at breast height)												
	All classes	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
<i>----- Thousand trees -----</i>													
Shortleaf-loblolly pine	926265	348194	224616	130808	84688	47491	35092	24990	14200	8216	4279	3604	86
Cypress	6562	1981	984	868	961	293	401	442	230	187	68	129	19
Other softwoods	16801	11561	3395	1094	554	143	54	...	...	...	...	...	...
Total softwoods	949628	361736	228995	132770	86203	47927	35546	25432	14430	8403	4347	3733	105
Select white oaks	92548	36673	24641	9221	8412	5261	3116	2359	1088	760	496	497	24
Select red oaks	31825	11679	7179	3122	3166	2020	1547	806	724	464	420	616	80
Other white oaks	70037	20584	16227	11862	8133	5929	2985	1786	1035	664	321	455	57
Other red oaks	185898	79530	36473	19986	15288	12603	7853	5289	3661	2264	1351	1481	119
Hickory	82469	41255	15567	10371	6394	3054	2666	1482	822	491	135	220	13
Hard maple	1252	555	444	93	147	...	...	...	...	13	...	...	...
Soft maple	72856	52068	12248	4771	2058	1104	263	133	107	35	29	31	9
Beech	4102	1504	1077	108	220	352	196	190	74	131	79	143	28
Sweetgum	423045	252763	75947	40890	23356	13772	6919	4555	2451	1274	632	472	14
Tupelo-blackgum	45834	20956	11696	5717	2638	2138	1298	646	361	147	134	90	13
Ash	34576	19590	5641	4193	2505	1261	623	308	259	75	41	82	...
Cottonwood-aspen	1175	478	492	...	...	32	...	67	41	11	9	41	4
Basswood	40	...	...	...	...	...	25	15	...	...	...	...	...
Black walnut	1152	953	...	102	...	97	...	...	...	...	...	...	...
Other hardwoods	187323	117673	40436	14276	6657	4134	1890	1153	317	302	268	191	27
Total hardwoods	1234131	656260	248068	124711	78975	51758	29379	18789	10939	6633	3913	4319	388
All species	2183759	1017996	477062	257482	165178	99685	64925	44221	25368	15036	8260	8052	493

Table 12—Volume of growing stock on timberland by species and diameter class, Southwest Arkansas, 1988

Species	Diameter class (inches at breast height)										
	All classes	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
<i>----- Million cubic feet -----</i>											
Shortleaf-loblolly pine	4628.5	318.6	521.9	601.1	708.6	748.8	593.3	457.3	300.8	362.8	15.5
Cypress	58.9	1.6	3.2	3.0	6.2	9.9	8.1	9.1	3.7	11.7	2.4
Other softwoods	7.6	2.6	3.0	1.3	0.7	...	...	...	...	...	...
Total softwoods	4695.1	322.8	528.2	605.3	715.5	758.6	601.5	466.3	304.5	374.5	17.9
Select white oaks	394.2	25.2	51.5	57.6	56.5	60.8	36.7	36.8	28.5	38.1	2.5
Select red oaks	235.3	7.9	18.5	22.0	29.0	21.9	26.0	21.0	24.1	54.2	10.8
Other white oaks	326.0	30.4	44.6	58.1	46.4	41.4	30.6	24.1	13.9	30.0	6.4
Other red oaks	983.2	51.6	95.3	139.5	143.1	133.7	122.4	100.1	72.2	111.0	14.3
Hickory	248.4	23.9	32.3	32.5	44.4	36.2	29.1	20.4	7.9	19.9	1.8
Hard maple	1.3	0.3	0.7	...	...	...	...	0.4	...	...	...
Soft maple	51.8	13.1	11.2	11.4	4.5	2.5	3.1	1.1	1.6	2.3	1.0
Beech	36.9	0.5	1.3	3.7	2.7	3.8	2.7	5.5	2.7	9.8	4.1
Sweetgum	924.8	97.4	144.6	168.7	138.9	129.3	97.3	67.8	40.4	38.9	1.7
Tupelo-blackgum	117.7	12.8	15.1	22.0	22.4	15.2	11.7	5.9	6.3	4.9	1.5
Ash	76.8	10.6	17.4	13.3	10.5	7.0	8.5	3.1	1.9	4.6	...
Cottonwood-aspen	8.2	...	...	0.1	...	1.9	1.5	0.4	0.6	3.2	0.5
Basswood	0.7	...	...	...	0.4	0.3	...	...	...	...	...
Black walnut	1.3	0.2	...	1.2	...	...	...	...	...	...	...
Other hardwoods	220.2	33.5	37.5	42.9	28.8	27.6	9.4	12.2	13.4	12.5	2.4
Total hardwoods	3626.8	307.2	470.0	572.9	527.5	481.7	378.9	298.7	213.4	329.4	47.0
All species	8321.8	630.1	998.2	1178.3	1242.9	1240.3	980.4	765.0	517.9	703.9	64.9

Table 13—Volume of growing stock in the saw-log portion of sawtimber¹ trees on timberland by species and diameter class, Southwest Arkansas, 1988

Species	Diameter class (inches at breast height)								
	All classes	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
----- Million cubic feet -----									
Shortleaf-loblolly pine	3301.0	481.9	613.3	665.3	528.8	408.4	269.1	320.6	13.6
Cypress	46.6	2.2	4.6	8.6	7.0	8.1	3.3	10.6	2.2
Other softwoods	1.6	1.0	0.6	...	...	...	...	...	...
Total softwoods	3349.2	485.1	618.4	673.9	535.8	416.5	272.4	331.2	15.8
Select white oaks	209.9	...	40.4	49.9	30.1	30.0	24.4	32.7	2.4
Select red oaks	155.8	...	20.2	17.9	22.1	18.4	21.1	46.5	9.5
Other white oaks	160.1	...	34.4	34.9	26.2	20.5	12.6	26.2	5.4
Other red oaks	576.1	...	103.9	110.5	105.0	86.4	62.3	95.7	12.4
Hickory	129.3	...	33.1	29.6	24.5	17.5	6.8	16.3	1.5
Hard maple	0.3	...	...	...	...	0.3	...	...	...
Soft maple	12.5	...	3.4	1.8	2.4	0.9	1.4	1.9	0.8
Beech	26.6	...	1.9	3.1	2.4	5.0	2.3	8.5	3.3
Sweetgum	418.0	...	94.9	105.0	85.7	60.4	35.6	34.8	1.6
Tupelo-blackgum	54.7	...	16.6	12.4	9.8	5.0	5.2	4.2	1.5
Ash	29.1	...	7.7	5.8	7.0	2.7	1.8	4.1	...
Cottonwood-aspen	6.7	...	...	1.5	1.1	0.3	0.3	3.0	0.5
Basswood	0.5	...	0.3	0.2	...	...	...	...	...
Other hardwoods	84.7	...	21.5	21.4	8.4	10.4	11.0	10.3	1.8
Total hardwoods	1864.1	...	378.0	394.1	324.7	257.7	184.8	284.2	40.8
All species	5213.4	485.1	996.4	1067.9	860.5	674.2	457.2	615.4	56.6

¹That part of the bole of sawtimber trees between a 1-foot stump and saw-log top, including the portion of the forks large enough to contain a saw log.

Table 14—Volume of sawtimber on timberland by species and diameter class, Southwest Arkansas, 1988

Species	Diameter class (inches at breast height)								
	All classes	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
----- Million board feet -----									
Shortleaf-loblolly pine	20620.0	2639.8	3629.9	4134.1	3418.6	2702.3	1804.7	2197.7	92.8
Cypress	256.4	10.0	22.5	42.2	39.0	47.0	18.6	63.2	14.0
Other softwoods	7.9	5.1	2.8	...	...	...	...	...	...
Total softwoods	20884.3	2654.8	3655.2	4176.3	3457.7	2749.2	1823.3	2260.9	106.9
Select white oaks	1261.4	...	221.0	288.8	180.4	190.0	157.4	208.3	15.6
Select red oaks	940.3	...	110.5	101.6	130.2	112.3	130.0	300.8	54.9
Other white oaks	947.5	...	184.6	199.7	155.3	121.3	79.1	169.5	38.0
Other red oaks	3390.9	...	568.9	623.2	614.1	524.3	381.5	605.1	73.7
Hickory	779.3	...	184.6	171.3	151.4	110.4	44.8	106.6	10.2
Hard maple	1.8	...	...	...	...	1.8	...	...	...
Soft maple	71.0	...	19.3	9.9	13.0	4.1	8.2	11.1	5.3
Beech	162.6	...	10.4	18.1	14.4	32.3	13.5	50.9	23.1
Sweetgum	2466.6	...	530.6	610.0	515.0	369.8	218.5	217.0	5.7
Tupelo-blackgum	303.7	...	89.6	68.2	55.0	28.5	29.0	24.7	8.7
Ash	163.6	...	40.4	30.7	41.5	16.3	10.4	24.3	...
Cottonwood-aspen	41.6	...	...	9.1	6.6	1.7	2.3	18.8	3.0
Basswood	2.0	...	1.3	0.7	...	...	...	...	...
Other hardwoods	494.4	...	119.2	124.9	50.5	62.3	66.2	62.6	8.8
Total hardwoods	11026.8	...	2080.3	2256.4	1927.4	1575.0	1141.1	1799.7	247.0
All species	31911.1	2654.8	5735.6	6432.6	5385.0	4324.2	2964.3	4060.6	353.9

Table 15—Volume of growing stock and sawtimber on timberland by county and species group, Southwest Arkansas, 1988

County	Growing stock						Sawtimber					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Pine			Soft ¹	Hard ²		Pine			Soft ¹	Hard ²
		Planted	Natural	Other				Planted	Natural	Other		
----- Million cubic feet -----						----- Million board feet -----						
Ashley	487.8	...	359.8	3.1	21.5	103.3	2169.7	...	1723.6	13.1	63.4	369.6
Bradley	515.1	20.4	250.3	3.8	72.0	168.5	2110.9	87.2	1159.5	19.4	245.5	599.2
Calhoun	410.5	22.1	206.4	13.8	61.5	106.7	1512.0	26.2	873.8	69.0	181.9	361.1
Clark	503.2	42.0	242.3	4.1	61.4	153.3	1907.2	120.1	1148.1	15.8	143.8	479.4
Cleveland	563.8	28.9	260.5	0.5	114.1	159.7	2264.3	121.3	1203.2	1.6	314.9	623.4
Columbia	544.9	12.4	305.6	1.9	75.3	149.7	2003.5	15.0	1333.9	4.7	190.3	459.5
Dallas	474.6	27.6	263.1	0.4	63.4	120.2	1828.3	74.3	1222.3	...	168.5	363.2
Drew	448.4	54.3	195.2	9.7	69.5	119.7	1808.0	232.6	942.1	31.1	180.8	421.4
Grant	474.3	63.5	152.9	5.9	102.2	149.8	1542.5	86.2	617.2	27.7	295.2	516.3
Hempstead	385.4	109.2	112.9	0.6	54.4	108.3	1462.8	527.6	497.3	2.7	123.1	312.1
Hot Spring	229.4	20.8	88.7	...	30.1	89.8	690.0	37.7	367.3	...	44.5	240.5
Howard	206.1	33.6	81.6	0.4	34.0	56.6	672.1	69.1	407.7	...	78.0	117.3
Lafayette	318.9	18.9	172.0	0.6	47.8	79.7	1096.1	38.3	732.2	3.0	88.7	233.9
Little River	206.2	10.6	108.4	...	23.2	64.0	824.4	5.3	602.8	...	31.5	184.9
Miller	180.4	8.4	72.4	6.8	28.3	64.5	589.0	18.7	322.5	24.7	64.1	159.0
Nevada	432.8	43.1	203.2	1.8	67.3	117.4	1675.1	160.7	931.0	8.4	162.9	412.1
Ouachita	563.2	19.4	270.6	1.5	109.7	162.0	2198.0	97.0	1286.1	7.2	315.4	492.3
Pike	276.1	57.0	152.3	...	13.5	53.3	1119.2	217.5	716.9	...	40.5	144.4
Sevier	248.2	2.7	73.3	5.3	63.8	103.0	915.2	1.6	377.4	9.6	197.1	329.4
Union	852.7	57.2	404.7	6.4	132.6	251.8	3523.0	177.8	2041.0	26.3	348.5	929.4
All counties	8321.8	652.2	3976.4	66.5	1245.5	2381.3	31911.1	2114.3	18505.7	264.3	3278.4	7748.4

¹Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.
²Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 16—Volume of timber on timberland by class of timber and species group, Southwest Arkansas, 1988

Class of timber	All species	Softwood			Hardwood	
		Pine			Soft ¹	Hard ²
		Planted	Natural	Other		
----- Million cubic feet -----						
Sawtimber trees:						
Saw-log portion	5213.4	350.1	2950.9	48.2	559.1	1305.0
Upper-stem portion	907.3	60.7	426.4	7.8	130.7	281.7
Total	6120.6	410.8	3377.3	55.9	689.9	1586.7
Poletimber trees	2201.2	241.3	599.1	10.6	555.6	794.6
All growing-stock trees	8321.8	652.2	3976.4	66.5	1245.5	2381.3
Rough trees:						
Sawtimber size	175.4	2.2	19.9	3.2	47.1	103.0
Poletimber size	279.3	7.6	45.3	2.1	65.8	158.5
Total	454.8	9.7	65.3	5.4	112.9	261.5
Rotten trees:						
Sawtimber size	82.4	0.2	0.9	5.8	22.5	53.0
Poletimber size	8.4	...	...	...	3.7	4.7
Total	90.8	0.2	0.9	5.8	26.2	57.7
Salvable dead trees:						
Sawtimber size	18.5	1.4	7.4	...	3.3	6.4
Poletimber size	12.4	1.4	4.8	0.3	1.0	5.0
Total	30.9	2.7	12.2	0.3	4.3	11.4
All classes	8898.3	664.9	4054.8	78.0	1388.8	2711.9

¹Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

²Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 17—Volume of live trees and growing stock on timberland by ownership class and species group, Southwest Arkansas, 1988

Ownership class	Live trees						Growing stock					
	Softwood			Hardwood			Softwood			Hardwood		
	Pine						Pine					
	All species	Planted	Natural	Other	Soft ¹	Hard ²	All species	Planted	Natural	Other	Soft ¹	Hard ²
----- Million cubic feet -----												
Other public	260.8	6.0	79.3	11.7	43.6	120.1	236.3	5.8	79.3	10.8	39.5	100.9
Forest industry	4145.4	395.8	1954.8	45.1	585.6	1164.1	3897.9	389.5	1920.5	37.9	527.2	1022.8
Forest industry-leased	17.3	...	5.5	1.3	0.6	9.9	15.8	...	5.5	1.3	0.4	8.5
Other private	4443.9	260.4	2003.0	19.5	754.6	1406.4	4171.8	256.9	1971.0	16.5	678.3	1249.1
All ownerships	8867.4	662.1	4042.6	77.7	1384.5	2700.5	8321.8	652.2	3976.4	66.5	1245.5	2381.3

¹Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

²Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 18—Average net annual growth of growing stock and sawtimber on timberland by county and species group, Southwest Arkansas, 1988

County	Growing stock						Sawtimber					
	All species	Softwood			Hardwood		All species	Softwood			Hardwood	
		Planted	Natural	Other	Soft ¹	Hard ²		Planted	Natural	Other	Soft ¹	Hard ²
----- Million cubic feet -----						----- Million board feet -----						
Ashley	27.5	0.3	21.3	0.1	1.0	4.8	124.1	1.7	100.6	0.7	2.7	18.4
Bradley	28.5	0.7	17.4	0.1	2.8	7.4	132.9	4.7	84.2	0.6	12.9	30.3
Calhoun	26.8	0.7	16.9	0.1	2.7	6.5	97.0	0.8	64.1	...	9.0	22.9
Clark	23.0	0.1	15.3	0.1	2.1	5.5	114.2	0.4	74.0	-0.3	9.1	30.9
Cleveland	23.9	0.5	14.2	...	3.4	5.7	103.3	3.0	66.8	0.2	9.1	24.3
Columbia	30.0	1.0	19.9	0.1	2.3	6.7	120.2	...	89.0	-0.1	6.8	24.5
Dallas	27.1	1.0	16.0	...	2.9	7.1	112.4	5.2	72.8	...	8.7	25.6
Drew	25.3	1.1	15.9	0.1	2.4	5.8	112.2	8.2	77.4	0.1	5.7	20.7
Grant	23.5	...	15.2	...	1.8	6.5	75.7	-1.0	50.2	0.4	4.8	21.3
Hempstead	14.7	1.4	8.7	...	1.0	3.5	73.6	14.3	40.3	...	2.9	16.2
Hot Spring	10.3	0.7	4.6	...	0.7	4.1	41.1	4.2	17.7	...	3.2	16.0
Howard	12.4	0.6	7.9	-0.1	1.0	3.1	51.1	3.6	36.3	-0.1	3.9	7.4
Lafayette	21.4	0.1	14.2	...	1.9	5.1	76.7	1.3	56.4	-0.1	2.8	16.2
Little River	9.9	...	6.0	...	1.0	2.9	45.3	...	31.8	...	1.9	11.6
Miller	11.0	0.1	5.6	...	1.4	3.9	43.0	0.4	26.2	0.3	3.3	12.9
Nevada	18.1	0.9	11.0	0.1	1.2	4.8	91.7	5.5	56.0	0.5	6.5	23.2
Ouachita	26.6	0.6	14.0	...	3.4	8.5	119.0	1.5	71.6	-0.1	13.8	32.2
Pike	14.5	1.6	10.9	...	0.5	1.5	70.4	12.4	51.3	...	1.8	4.9
Sevier	11.0	...	3.8	0.3	1.6	5.3	44.7	0.1	18.9	0.4	5.1	20.2
Union	38.8	0.7	23.3	0.2	3.2	11.4	185.6	4.6	122.3	1.1	10.4	47.2
All counties	424.1	12.1	262.2	1.2	38.5	110.2	1834.1	71.1	1208.1	3.5	124.4	427.0

¹Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

²Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 19—Average net annual removals of growing stock and sawtimber on timberland by county and species group, Southwest Arkansas, 1988

County	Growing stock						Sawtimber					
	Softwood			Hardwood			Softwood			Hardwood		
	All species	Pine			Soft ¹	Hard ²	All species	Pine			Soft ¹	Hard ²
		Planted	Natural	Other				Planted	Natural	Other		
----- Million cubic feet -----						----- Million board feet -----						
Ashley	25.9	0.5	18.9	...	1.9	4.7	116.4	1.3	98.1	...	2.4	14.7
Bradley	21.9	2.9	15.5	...	1.0	2.6	100.4	7.9	79.3	...	2.4	10.8
Calhoun	15.9	0.6	11.5	...	0.5	3.2	54.0	0.4	43.5	...	1.3	8.8
Clark	32.8	...	19.5	0.1	2.8	10.5	128.5	...	85.7	0.3	9.7	32.8
Cleveland	19.5	0.6	12.1	...	1.7	5.0	79.2	0.2	53.3	...	5.7	20.0
Columbia	21.8	1.5	16.6	...	0.8	2.9	77.2	...	66.2	...	2.2	8.8
Dallas	19.2	0.8	12.1	...	1.2	5.0	79.5	2.7	60.2	...	1.4	15.1
Drew	30.1	2.0	17.4	0.5	2.0	8.2	128.4	5.2	90.2	1.6	4.6	26.8
Grant	23.5	...	10.9	...	3.0	9.5	103.5	...	53.1	...	12.0	38.4
Hempstead	16.0	2.5	9.4	...	1.1	3.0	56.6	6.8	36.3	...	3.3	10.1
Hot Spring	15.0	2.7	7.2	...	0.8	4.3	62.8	14.5	35.5	...	1.2	11.5
Howard	28.7	1.4	20.8	...	1.9	4.6	141.0	5.1	118.1	...	4.0	13.9
Lafayette	12.1	...	10.2	...	0.2	1.7	40.7	...	35.2	...	0.1	5.4
Little River	10.3	...	8.1	...	0.4	1.9	36.3	...	32.6	...	0.2	3.5
Miller	7.5	...	4.1	...	1.0	2.3	24.9	...	16.9	...	2.8	5.2
Nevada	20.1	1.4	10.1	...	2.5	6.1	76.7	5.1	46.2	...	7.2	18.2
Ouachita	29.5	1.6	12.2	...	6.0	9.7	118.6	5.7	57.7	...	25.7	29.5
Pike	23.9	2.8	17.3	0.1	1.0	2.8	102.0	8.0	87.8	0.2	1.6	4.4
Sevier	18.5	0.1	12.9	...	1.7	3.8	77.1	0.2	63.9	...	3.2	9.8
Union	43.7	1.2	30.4	...	3.6	8.4	193.7	5.0	150.8	0.2	8.0	29.6
All counties	436.0	22.6	277.3	0.8	35.0	100.3	1797.3	68.1	1310.6	2.3	98.9	317.5

¹Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

²Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 20—Average net annual growth and average annual removals of growing stock on timberland by species, Southwest Arkansas, 1988

Species	Growth	Removals
----- Million cubic feet -----		
Yellow pines	274.3	299.9
Other softwoods	1.2	0.8
Total softwoods	275.5	300.7
Select white-red oaks	30.7	29.0
Other white-red oaks	62.7	60.9
Hickory	7.8	6.9
Hard maple	0.1	...
Sweetgum	29.0	27.4
Ash-walnut-black cherry	2.7	1.2
Other hardwoods	15.7	9.8
Total hardwoods	148.7	135.3
All species	424.1	436.0

Table 21—Average net annual growth and average annual removals of sawtimber on timberland by species, Southwest Arkansas, 1988

Species	Growth	Removals
---- Million board feet ----		
Yellow pines	1279.2	1378.7
Other softwoods	3.5	2.3
Total softwoods	1282.7	1381.0
Select white-red oaks	121.3	103.5
Other white-red oaks	250.7	186.6
Hickory	30.0	20.9
Hard maple	...	...
Sweetgum	95.2	83.6
Ash-walnut-black cherry	8.6	1.8
Other hardwoods	45.7	19.9
Total hardwoods	551.5	416.4
All species	1834.1	1797.3

Table 22—Average annual mortality of growing stock and sawtimber on timberland by species, Southwest Arkansas, 1988

Species	Growing stock	Sawtimber
---- Million cubic feet ---- Million board feet ----		
Yellow pines	28.1	71.9
Other softwoods	0.6	1.3
Total softwoods	28.7	73.2
Select white-red oaks	2.6	8.1
Other white-red oaks	10.6	26.9
Hickory	2.0	5.6
Sweetgum	7.0	18.2
Ash-walnut-black cherry	0.9	1.1
Other hardwoods	4.3	10.3
Total hardwoods	27.4	70.3
All species	56.1	143.4

Table 23—Average net annual growth and average annual removals of growing stock on timberland by ownership class and species group, Southwest Arkansas, 1988

Ownership class	Growth						Removals					
	Softwood			Hardwood			Softwood			Hardwood		
	All species	Pine			Soft ¹	Hard ²	All species	Pine			Soft ¹	Hard ²
		Planted	Natural	Other				Planted	Natural	Other		
----- Million cubic feet -----												
Other public	6.1	...	2.8	0.2	0.7	2.4	4.8	0.7	3.1	...	0.2	0.8
Forest industry	217.9	3.9	147.9	0.7	16.1	49.3	258.4	7.0	178.4	0.2	20.5	52.4
Forest industry-leased	1.1	...	0.5	0.1	...	0.5	0.7	...	0.7	...	...	...
Other private	199.0	8.1	111.0	0.3	21.8	57.9	172.0	14.9	95.1	0.6	14.3	47.0
All ownerships	424.1	12.1	262.2	1.2	38.5	110.2	436.0	22.6	277.3	0.8	35.0	100.3

¹Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

²Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 24—Average net annual growth and average annual removals of sawtimber on timberland by ownership class and species group, Southwest Arkansas, 1988

Ownership class	Growth						Removals					
	Softwood			Hardwood			Softwood			Hardwood		
	All species	Pine		Other	Soft ¹	Hard ²	All species	Pine		Other	Soft ¹	Hard ²
		Planted	Natural					Planted	Natural			
----- Million board feet -----												
Other public	29.6	0.1	15.7	0.9	1.9	11.0	20.3	4.0	14.4	...	0.5	1.4
Forest industry	910.2	24.5	639.8	1.6	58.7	185.7	1136.7	24.2	881.5	0.5	66.2	164.4
Forest industry-leased	5.2	...	2.9	...	0.1	2.2	3.8	...	3.8	...	...	...
Other private	889.2	46.5	549.8	1.0	63.8	228.1	636.6	39.8	411.0	1.8	32.2	151.7
All ownerships	1834.1	71.1	1208.1	3.5	124.4	427.0	1797.3	68.1	1310.6	2.3	98.9	317.5

¹Hardwood species with an average specific gravity of 0.50 or less such as gums, yellow-poplar, cottonwood, red maple, basswood, aspen, and willow.

²Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and green and white ash.

Table 25—Volume of sawtimber on timberland by species and tree grade, Southwest Arkansas, 1988

Species	All grades	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
<i>----- Million board feet -----</i>						
Yellow pines	20620.0	4871.6	4239.6	11399.1	...	109.8
Cypress	256.4	108.9	79.8	61.9	...	5.9
Redcedar	7.9	7.9	...	...	...	...
Total softwoods	20884.3	4988.3	4319.3	11461.0	...	115.6
Select white-red oaks	2201.8	330.5	458.4	904.1	418.3	90.4
Other white-red oaks	4338.5	213.3	595.1	1723.9	1530.8	275.5
Hickory	779.3	48.7	118.1	372.7	186.3	53.5
Hard maple	1.8	...	...	...	1.8	...
Sweetgum	2466.6	303.1	579.2	1030.3	400.0	154.1
Tupelo and blackgum	303.7	26.1	56.3	161.1	36.2	24.0
Ash-walnut-black cherry	186.4	22.3	44.5	93.7	13.1	12.9
Other hardwoods	748.7	40.5	96.7	246.2	244.4	121.0
Total hardwoods	11026.8	984.5	1948.2	4532.0	2830.9	731.2
All species	31911.1	5972.8	6267.6	15993.0	2830.9	846.9

Supplemental Tables 26-36

Table 26—Area of timberland by stand age, forest type group and type of regeneration, Southwest Arkansas, 1988

Stand age class	Pine		Oak-pine		Other hardwood types	
	Artificial	Natural	Artificial	Natural	Artificial	Natural
<i>----- Thousand acres -----</i>						
1-10	320.0	54.3	123.9	44.1	92.0	101.9
11-20	263.3	38.5	38.4	5.7	...	4.9
21-30	72.2	42.8	...	10.3	...	...
31-40	55.0	61.0	5.4	16.2	...	...
41-50	21.8	32.1	...	...	...	...
> 50	...	21.7	5.8	...	...	...
Mixed	95.0	1484.4	32.4	1118.4	21.8	2257.1
Total	827.3	1734.8	205.9	1194.8	113.8	2364.0

Table 27—Volume of softwood growing stock on timberland by forest type, Southwest Arkansas, 1988

County	Total	Forest type group				
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress
		Planted	Natural			
----- <i>Million cubic feet</i> -----						
Ashley	363.0	...	297.0	47.6	10.0	8.4
Bradley	274.5	19.1	155.1	73.2	15.2	12.0
Calhoun	242.3	22.1	146.6	46.2	6.3	21.0
Clark	288.5	40.1	135.6	86.1	21.2	5.4
Cleveland	289.9	28.9	169.7	62.7	26.8	1.7
Columbia	319.9	12.4	214.0	79.3	11.9	2.3
Dallas	291.1	26.5	162.1	75.8	24.6	2.1
Drew	259.2	44.8	129.7	54.6	17.3	12.8
Grant	222.4	56.8	90.1	52.8	16.7	5.9
Hempstead	222.7	109.2	48.7	56.1	8.1	0.6
Hot Spring	109.5	19.2	21.0	45.1	21.5	2.8
Howard	115.6	31.1	37.7	40.6	2.5	3.8
Lafayette	191.5	18.9	121.5	27.0	12.8	11.3
Little River	119.0	10.6	64.0	42.3	1.4	0.7
Miller	87.6	8.4	53.1	10.4	9.0	6.8
Nevada	248.1	25.3	136.0	60.5	13.0	13.2
Ouachita	291.4	19.4	189.0	60.7	12.5	9.8
Pike	209.3	52.2	100.8	51.0	5.3	...
Sevier	81.4	2.7	51.1	16.9	10.1	0.5
Union	468.3	52.1	257.5	117.5	30.8	10.3
All counties	4695.1	599.8	2580.4	1106.3	277.0	131.5

Table 28—Volume of hardwood growing stock on timberland by forest type, Southwest Arkansas, 1988

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress	Elm-ash- cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Ashley	124.8	...	19.2	13.1	35.3	57.3	...
Bradley	240.5	...	4.9	45.8	56.6	133.3	...
Calhoun	168.2	...	12.1	17.8	23.1	115.2	...
Clark	214.7	3.3	15.3	50.5	75.1	70.5	...
Cleveland	273.8	0.5	27.1	32.6	109.9	103.8	...
Columbia	225.0	1.1	30.0	52.9	60.8	80.1	...
Dallas	183.6	8.6	27.0	29.2	71.6	47.1	...
Drew	189.2	0.5	17.1	24.1	79.0	68.5	...
Grant	252.0	3.0	12.2	36.5	79.5	120.7	...
Hempstead	162.7	6.9	10.3	40.1	51.0	54.3	...
Hot Spring	119.9	4.8	7.3	27.2	42.9	37.7	...
Howard	90.6	1.0	3.4	26.8	24.2	35.1	...
Lafayette	127.4	1.4	17.4	27.3	31.2	50.2	...
Little River	87.2	...	12.1	26.6	24.2	22.8	1.5
Miller	92.9	1.9	17.2	7.5	42.8	23.5	...
Nevada	184.7	1.9	16.8	45.7	57.8	62.5	...
Ouachita	271.8	4.9	26.5	36.9	48.5	154.9	...
Pike	66.8	9.6	13.1	33.2	11.0	...	...
Sevier	166.8	1.2	7.5	18.0	60.1	80.0	...
Union	384.4	6.0	53.8	68.6	118.6	137.4	...
All counties	3626.8	56.6	350.4	660.2	1103.1	1454.9	1.5

Table 29—Volume of softwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, Southwest Arkansas, 1988

County	Total	Forest type group				
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress
		Planted	Natural			
----- Million cubic feet -----						
Ashley	273.1	...	218.9	39.7	7.3	7.2
Bradley	196.6	13.6	107.4	54.0	11.5	10.2
Calhoun	162.0	5.2	98.7	36.9	3.8	17.4
Clark	208.6	19.7	99.5	72.4	13.2	3.8
Cleveland	212.3	19.6	118.8	50.0	22.8	1.2
Columbia	220.8	2.6	144.6	64.6	7.1	1.9
Dallas	205.0	13.0	115.7	55.7	19.1	1.6
Drew	188.4	30.8	95.1	41.0	13.4	8.2
Grant	114.8	9.4	54.5	34.8	11.2	4.8
Hempstead	167.5	86.0	35.6	39.8	5.6	0.5
Hot Spring	67.3	6.4	11.5	30.1	16.5	2.6
Howard	74.1	10.8	31.5	27.1	1.6	3.0
Lafayette	130.6	7.2	86.3	20.4	6.6	10.1
Little River	92.3	1.1	54.5	35.3	0.7	0.6
Miller	60.8	3.2	41.4	5.5	5.5	5.1
Nevada	185.4	19.3	99.6	43.3	10.7	12.5
Quachita	227.7	14.6	141.1	52.0	10.7	9.3
Pike	144.3	31.1	70.4	38.8	4.0	...
Sevier	60.2	0.3	39.4	12.7	7.2	0.5
Union	357.5	28.9	201.2	91.5	26.5	9.4
All counties	3349.2	323.0	1865.7	845.6	205.0	110.0

Table 30—Volume of hardwood growing stock in the saw-log portion of sawtimber trees on timberland by forest type, Southwest Arkansas, 1988

County	Total	Forest type group					
		Loblolly-shortleaf pine		Oak- pine	Oak- hickory	Oak-gum- cypress	Elm-ash- cottonwood
		Planted	Natural				
----- Million cubic feet -----							
Ashley	73.1	...	6.8	6.0	22.7	37.7	...
Bradley	137.8	...	1.2	18.3	29.1	89.2	...
Calhoun	91.6	...	2.0	8.3	10.9	70.3	...
Clark	107.1	0.6	5.1	18.3	36.4	46.6	...
Cleveland	156.5	...	9.7	13.3	59.1	74.4	...
Columbia	112.0	...	9.4	23.5	29.4	49.7	...
Dallas	90.6	4.6	11.1	11.2	34.5	29.1	..
Drew	98.9	0.2	4.0	5.2	47.9	41.7	...
Grant	133.5	0.6	5.7	11.9	35.5	79.8	...
Hempstead	75.4	1.4	6.6	14.6	24.9	28.0	...
Hot Spring	50.5	...	3.4	15.4	17.0	14.7	...
Howard	33.1	0.4	2.2	9.5	7.9	13.2	...
Lafayette	56.9	0.2	5.6	12.6	10.3	28.2	...
Little River	37.3	...	6.5	11.0	8.8	10.6	0.5
Miller	38.4	...	8.1	4.0	16.7	9.5	...
Nevada	96.0	0.5	6.7	17.0	29.3	42.4	...
Ouachita	141.6	2.5	7.6	14.6	17.9	99.1	...
Pike	31.2	4.3	3.2	17.7	5.9	...	...
Sevier	88.2	0.4	2.1	5.9	30.7	49.2	...
Union	214.3	2.4	19.3	32.6	66.9	93.1	...
All counties	1864.1	18.1	126.3	270.8	541.7	906.7	0.5

Table 31—Volume of timber on timberland by county, class of timber and species group, Southwest Arkansas, 1988

County	All classes	Growing stock		Rough		Rotten	
		Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
----- Million cubic feet -----							
Ashley	509.5	363.0	124.8	2.4	16.5	...	2.8
Bradley	540.4	274.5	240.5	1.1	18.8	...	5.4
Calhoun	434.2	242.3	168.2	3.2	15.5	0.9	4.0
Clark	537.2	288.5	214.7	6.8	25.5	...	1.8
Cleveland	592.3	289.9	273.8	5.5	15.2	2.2	5.8
Columbia	579.4	319.9	225.0	6.1	23.9	...	4.6
Dallas	499.4	291.1	183.6	1.0	14.5	1.7	7.7
Drew	505.1	259.2	189.2	9.8	37.9	0.7	8.3
Grant	501.0	222.4	252.0	3.5	19.8	0.6	2.8
Hempstead	404.7	222.7	162.7	1.2	14.5	...	3.6
Hot Spring	246.6	109.5	119.9	2.7	11.4	...	3.1
Howard	218.2	115.6	90.6	1.0	9.5	...	1.5
Lafayette	331.7	191.5	127.4	0.6	9.0	...	3.2
Little River	225.2	119.0	87.2	3.7	12.9	...	2.5
Miller	205.2	87.6	92.9	2.5	16.2	0.3	5.7
Nevada	462.3	248.1	184.7	2.5	22.8	0.6	3.7
Ouachita	595.5	291.4	271.8	3.7	23.2	...	5.4
Pike	305.7	209.3	66.8	16.5	12.0	...	1.1
Sevier	268.1	81.4	166.8	0.3	18.5	...	1.2
Union	905.8	468.3	384.4	6.1	37.2	...	9.8
All counties	8867.4	4695.1	3626.8	80.4	374.4	6.9	83.9

Table 32—Number of live trees on timberland by detailed species and diameter class, Southwest Arkansas, 1988

Species	Diameter class (inches at breast height)												
	All classes	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
----- Thousand trees -----													
Shortleaf pine	196905	105777	34535	15353	13295	9442	7497	5978	3059	1333	375	262	...
Loblolly pine	981441	425560	240829	127547	75459	39345	27987	19155	11223	6917	3935	3398	86
Redcedar	21636	15398	3927	1390	725	143	54	...	...	...	...	...	...
Cypress	7730	2472	984	1094	1011	561	401	461	274	199	68	175	30
Total softwoods	1207713	549208	280274	145385	90489	49491	35938	25594	14556	8449	4377	3835	117
Select white oaks	182651	106390	40430	11760	9193	5802	3417	2531	1167	798	566	560	38
Select red oaks	55423	29924	11429	3636	3356	2067	1680	868	757	475	449	685	96
Other white oaks	117477	52705	26325	14056	9174	6619	3454	2138	1202	747	379	589	90
Other red oaks	346510	215512	52031	24209	17005	13480	8562	5753	3894	2446	1569	1865	184
Sweet pecan	300	...	...	196	59	...	...	...	14	...	...	31	...
Water hickory	6657	1500	2510	808	884	322	183	141	121	131	38	19	...
Other hickories	174168	118921	25381	13239	7019	3324	2882	1643	810	510	192	233	13
Persimmon	33826	29466	3023	678	442	161	56	...	...	...	...	...	...
Hard maple	1761	1064	444	93	147	...	...	...	...	13	...	...	...
Soft maple	271409	225372	30752	8887	3635	1474	539	377	236	68	19	40	9
Boxelder	6845	4159	1939	228	252	198	26	...	29	...	9	6	...
Beech	7691	3540	2105	108	341	436	225	234	101	201	106	210	83
Sweetgum	725059	489554	125367	52352	25597	14441	7533	4744	2733	1449	723	526	40
Blackgum	191400	144162	28152	9852	3252	2720	1517	834	464	207	126	101	13
Other gums/tupelos	4715	2118	1476	307	254	141	98	96	56	46	56	63	4
White ash	42246	31183	5750	2449	1143	745	501	256	138	49	10	21	...
Other ashes	52421	36146	8866	4110	1684	876	313	127	152	49	31	67	...
Sycamore	3504	1537	1028	374	123	114	78	86	46	47	40	22	9
Cottonwood	1253	478	492	77	...	32	...	67	41	11	9	41	4
Basswood	613	516	...	...	...	37	25	15	...	...	...	20	...
Magnolia	43	...	...	...	...	43	...	...	...	...	...	...	...
Sweetbay	23814	14202	7271	975	363	430	261	118	80	38	28	49	...
Willow	3229	2461	...	242	251	39	...	108	15	25	30	38	21
Black walnut	1255	953	...	204	...	97	...	...	...	...	...	...	...
Black cherry	32048	23577	6604	865	699	79	107	61	32	...	18	6	...
American elm	24197	15649	3104	2010	1447	944	397	357	97	110	56	26	...
Other elms	187761	151307	24284	7263	2361	1580	571	270	14	57	49	6	...
River birch	3100	1778	...	487	253	248	174	69	28	11	19	32	...
Hackberry	23904	13007	6123	2115	1149	519	239	305	146	113	93	79	15
Other locusts	1773	...	1040	355	55	106	130	57	31	...	...	...	...
Sassafras	29088	24640	3605	433	334	...	26	21	17	12	...	...	...
Dogwood	140344	123064	15044	2056	181	...	...	...	...	...	...	...	...
Holly	111952	83092	20508	4316	2181	1077	461	211	72	24	10	...	...
Other commercial	14607	11101	1973	865	424	158	56	23	...	...	...	7	...
Total hardwoods	2823045	1959081	457056	169602	93257	58310	33512	21510	12491	7636	4628	5341	620
Noncommercial	422961	339617	58526	18133	4554	1514	376	141	28	63	9	...	...
All species	4453718	2847906	795856	333120	188300	109315	69825	47245	27076	16148	9015	9177	736

Table 33—Number of growing-stock trees on timberland by detailed species and diameter class, Southwest Arkansas, 1988

Species	Diameter class (inches at breast height)										
	All classes	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
<i>----- Thousand trees -----</i>											
Shortleaf pine	52716	12889	12231	9191	7435	5957	3042	1333	375	262	...
Loblolly pine	300739	117919	72457	38300	27657	19033	11157	6883	3904	3342	86
Redcedar	1845	1094	554	143	54	...	...	...	...	...	...
Cypress	3598	868	961	293	401	442	230	187	68	129	19
Total softwoods	358897	132770	86203	47927	35546	25432	14430	8403	4347	3733	105
Select white oaks	31234	9221	8412	5261	3116	2359	1088	760	496	497	24
Select red oaks	12967	3122	3166	2020	1547	806	724	464	420	616	80
Other white oaks	33226	11862	8133	5929	2985	1786	1035	664	321	455	57
Other red oaks	69894	19986	15288	12603	7853	5289	3661	2264	1351	1481	119
Sweet pecan	286	196	59	...	...	...	...	...	...	31	...
Water hickory	2173	572	817	244	183	98	121	107	21	11	...
Other hickories	23188	9603	5518	2810	2483	1384	700	384	114	178	13
Persimmon	917	479	250	161	28	...	...	...	...	...	...
Hard maple	252	93	147	...	...	...	...	13	...	...	...
Soft maple	7933	4544	1850	1003	237	133	78	35	19	25	9
Boxelder	607	228	209	100	26	...	29	...	9	6	...
Beech	1521	108	220	352	196	190	74	131	79	143	28
Sweetgum	94335	40890	23356	13772	6919	4555	2451	1274	632	472	14
Blackgum	12564	5519	2519	2037	1298	610	305	124	86	53	13
Other gums/tupelos	618	198	120	101	...	36	56	23	47	37	...
White ash	3753	1483	943	552	394	201	124	26	10	21	...
Other ashes	5593	2710	1562	709	229	107	136	49	31	61	...
Sycamore	882	374	123	114	78	63	31	47	30	22	...
Cottonwood	206	...	...	32	...	67	41	11	9	41	4
Basswood	40	...	...	...	25	15	...	...	...	...	...
Sweetbay	1562	626	230	313	208	81	49	13	19	23	...
Willow	486	146	134	...	...	89	15	25	30	33	15
Black walnut	199	102	...	97	...	...	...	...	...	...	...
Black cherry	988	493	306	39	54	41	32	...	18	6	...
American elm	3965	1466	928	739	287	338	64	79	46	18	...
Other elms	9233	5070	2035	1392	493	171	...	34	38	...	...
River birch	1017	368	189	248	125	31	...	11	19	25	...
Hackberry	3490	1467	949	470	154	183	41	82	68	64	12
Other locusts	467	251	...	73	73	57	14	...	...	...	...
Sassafras	421	128	281	...	...	...	...	12	...	...	...
Dogwood	931	871	61	...	...	...	...	...	...	...	...
Holly	4546	2376	1052	585	362	100	72	...	...	...	...
Other commercial	308	161	118	...	29	...	...	...	...	...	...
Total hardwoods	329804	124711	78975	51758	29379	18789	10939	6633	3913	4319	388
All species	688701	257482	165178	99685	64925	44221	25368	15036	8260	8052	493

Table 34—Volume of growing-stock trees on timberland by detailed species and diameter class, Southwest Arkansas, 1988

Species	Diameter class (inches at breast height)										
	All classes	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
<i>----- Million cubic feet -----</i>											
Shortleaf pine	895.8	37.5	87.6	133.1	167.6	194.3	137.3	78.8	30.8	28.7	...
Loblolly pine	3732.8	281.1	434.2	468.0	540.9	554.5	456.0	378.5	270.0	334.1	15.5
Redcedar	7.6	2.6	3.0	1.3	0.7	...	...	...	...	...	...
Cypress	58.9	1.6	3.2	3.0	6.2	9.9	8.1	9.1	3.7	11.7	2.4
Total softwoods	4695.1	322.8	528.2	605.3	715.5	758.6	601.5	466.3	304.5	374.5	17.9
Select white oaks	394.2	25.2	51.5	57.6	56.5	60.8	36.7	36.8	28.5	38.1	2.5
Select red oaks	235.3	7.9	18.5	22.0	29.0	21.9	26.0	21.0	24.1	54.2	10.8
Other white oaks	326.0	30.4	44.6	58.1	46.4	41.4	30.6	24.1	13.9	30.0	6.4
Other red oaks	983.2	51.6	95.3	139.5	143.1	133.7	122.4	100.1	72.2	111.0	14.3
Sweet pecan	3.5	0.5	0.2	...	...	...	...	...	...	2.8	...
Water hickory	23.5	2.0	4.1	2.5	2.9	1.9	4.0	3.9	1.1	1.2	...
Other hickories	221.4	21.3	28.0	30.0	41.5	34.4	25.1	16.5	6.8	16.0	1.8
Persimmon	4.5	1.3	1.3	1.6	0.4	...	...	...	...	...	...
Hard maple	1.3	0.3	0.7	...	...	...	...	0.4	...	...	...
Soft maple	46.7	12.5	10.1	10.2	4.1	2.5	2.2	1.1	1.3	1.7	1.0
Boxelder	5.1	0.6	1.1	1.2	0.4	...	0.9	...	0.3	0.5	...
Beech	36.9	0.5	1.3	3.7	2.7	3.8	2.7	5.5	2.7	9.8	4.1
Sweetgum	924.8	97.4	144.6	168.7	138.9	129.3	97.3	67.8	40.4	38.9	1.7
Blackgum	109.4	12.4	14.7	20.9	22.4	14.6	10.2	5.2	4.7	2.9	1.5
Other gums/tupelos	8.3	0.3	0.4	1.2	...	0.6	1.5	0.7	1.6	1.9	...
White ash	33.4	3.4	6.6	6.0	6.3	4.6	4.0	1.0	0.5	0.8	...
Other ashes	43.4	7.1	10.8	7.3	4.1	2.4	4.4	2.1	1.4	3.8	...
Sycamore	13.1	1.2	0.9	1.4	1.2	1.9	0.9	2.1	1.7	1.8	...
Cottonwood	8.2	...	...	0.1	...	1.9	1.5	0.4	0.6	3.2	0.5
Basswood	0.7	...	...	...	0.4	0.3	...	...	...	...	...
Sweetbay	16.4	2.0	1.9	3.4	3.7	1.7	1.3	0.5	0.8	1.1	...
Willow	8.7	0.3	0.4	...	...	2.4	0.4	0.7	1.4	2.0	1.1
Black walnut	1.3	0.2	...	1.2	...	...	...	...	...	...	...
Black cherry	8.7	1.7	2.2	0.5	0.9	1.0	1.1	...	0.9	0.5	...
American elm	37.5	3.4	5.6	7.5	4.0	7.8	1.9	3.3	2.5	1.5	...
Other elms	53.9	11.9	11.3	15.0	7.8	4.3	...	1.7	1.9	...	...
River birch	12.6	1.4	1.8	3.3	2.4	1.1	...	0.4	1.0	1.2	...
Hackberry	32.9	3.2	4.8	4.4	1.9	4.5	2.0	3.1	3.3	4.4	1.3
Other locusts	3.8	0.6	...	0.6	1.5	1.0	0.1	...	...	...	...
Sassafras	1.8	0.3	1.2	...	...	...	...	0.3	...	...	...
Dogwood	1.8	1.6	0.2	...	...	...	...	...	...	...	...
Holly	23.1	4.1	5.3	5.2	4.7	2.1	1.8	...	...	...	...
Other commercial	1.4	0.4	0.7	...	0.3	...	...	...	...	...	...
Total hardwoods	3626.8	307.2	470.0	572.9	527.5	481.7	378.9	298.7	213.4	329.4	47.0
All species	8321.8	630.1	998.2	1178.3	1242.9	1240.3	980.4	765.0	517.9	703.9	64.9

Table 35—Volume of growing stock in the saw-log portion of sawtimber trees on timberland by detailed species and diameter class, Southwest Arkansas, 1988

Species	Diameter class (inches at breast height)								
	All classes	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 & larger
<i>----- Million cubic feet -----</i>									
Shortleaf pine	683.9	111.2	148.8	176.3	123.8	70.8	27.5	25.5	...
Loblolly pine	2617.1	370.8	464.4	489.0	405.0	337.6	241.7	295.1	13.6
Redcedar	1.6	1.0	0.6	...	...	...	...	...	...
Cypress	46.6	2.2	4.6	8.6	7.0	8.1	3.3	10.6	2.2
Total softwoods	3349.2	485.1	618.4	673.9	535.8	416.5	272.4	331.2	15.8
Select white oaks	209.9	...	40.4	49.9	30.1	30.0	24.4	32.7	2.4
Select red oaks	155.8	...	20.2	17.9	22.1	18.4	21.1	46.5	9.5
Other white oaks	160.1	...	34.4	34.9	26.2	20.5	12.6	26.2	5.4
Other red oaks	576.1	...	103.9	110.5	105.0	86.4	62.3	95.7	12.4
Sweet pecan	2.4	...	...	...	...	...	...	2.4	...
Water hickory	12.5	...	2.4	1.6	3.6	3.3	0.9	0.7	...
Other hickories	114.3	...	30.6	28.0	20.9	14.2	5.8	13.2	1.5
Persimmon	0.2	...	0.2	...	...	...	...	...	...
Hard maple	0.3	...	...	...	...	0.3	...	...	...
Soft maple	11.0	...	3.2	1.8	1.7	0.9	1.2	1.4	0.8
Boxelder	1.5	...	0.2	...	0.7	...	0.2	0.5	...
Beech	26.6	...	1.9	3.1	2.4	5.0	2.3	8.5	3.3
Sweetgum	418.0	...	94.9	105.0	85.7	60.4	35.6	34.8	1.6
Blackgum	49.5	...	16.6	11.9	8.5	4.5	4.0	2.6	1.5
Other gums/tupelos	5.2	...	...	0.5	1.3	0.5	1.3	1.6	...
White ash	13.8	...	4.6	3.9	3.3	0.8	0.4	0.7	...
Other ashes	15.3	...	3.1	1.9	3.7	1.8	1.3	3.4	...
Sycamore	8.0	...	1.0	1.5	0.8	1.8	1.5	1.4	...
Cottonwood	6.7	...	...	1.5	1.1	0.3	0.3	3.0	0.5
Basswood	0.5	...	0.3	0.2	...	...	...	...	...
Sweetbay	7.2	...	2.5	1.3	1.3	0.4	0.7	0.9	...
Willow	6.5	...	...	1.9	0.4	0.6	1.1	1.6	0.9
Black cherry	3.8	...	0.8	0.7	1.1	...	0.8	0.5	...
American elm	16.4	...	3.1	5.5	1.6	2.9	2.2	1.1	...
Other elms	12.2	...	5.9	3.6	...	1.5	1.3	...	...
River birch	5.0	...	1.8	1.0	...	0.4	0.8	1.1	...
Hackberry	16.5	...	1.3	3.7	1.8	2.6	2.6	3.6	0.9
Other locusts	2.0	...	1.3	0.7	...	...	...	...	...
Sassafras	0.3	...	...	...	...	0.3	...	...	...
Holly	6.3	...	3.4	1.5	1.4	...	...	...	...
Other commercial	0.2	...	0.2	...	...	...	...	...	...
Total hardwoods	1864.1	...	378.0	394.1	324.7	257.7	184.8	284.2	40.8
All species	5213.4	485.1	996.4	1067.9	860.5	674.2	457.2	615.4	56.6

**Table 36—Volume of timber on timberland by species and class of timber,
Southwest Arkansas, 1988**

Species	All live	Growing stock	Rough	Rotten
----- Million cubic feet -----				
Shortleaf pine	916.0	895.8	20.0	0.3
Loblolly pine	3788.7	3732.8	55.1	0.8
Redcedar	9.3	7.6	1.6	...
Cypress	68.4	58.9	3.7	5.8
Total softwoods	4782.4	4695.1	80.4	6.9
Select white oaks	421.7	394.2	24.0	3.5
Select red oaks	245.9	235.3	7.4	3.2
Other white oaks	362.8	326.0	29.1	7.8
Other red oaks	1057.4	983.2	54.0	20.2
Sweet pecan	4.0	3.5	0.5	...
Water hickory	27.2	23.5	2.6	1.1
Other hickories	253.6	221.4	24.6	7.7
Persimmon	6.2	4.5	1.7	...
Hard maple	1.3	1.3	...	...
Soft maple	72.9	46.7	22.3	3.8
Boxelder	5.8	5.1	0.7	...
Beech	48.1	36.9	3.5	7.6
Sweetgum	991.5	924.8	54.1	12.5
Blackgum	133.6	109.4	17.4	6.7
Other gums/tupelos	12.8	8.3	3.3	1.2
White ash	39.5	33.4	5.0	1.1
Other ashes	50.3	43.4	6.1	0.8
Sycamore	13.8	13.1	0.5	0.2
Cottonwood	8.3	8.2	0.1	...
Basswood	2.1	0.7	1.0	0.4
Magnolia	0.4	...	0.4	...
Sweetbay	21.5	16.4	2.8	2.3
Willow	10.0	8.7	1.1	0.1
Black walnut	1.5	1.3	0.2	...
Black cherry	11.9	8.7	2.7	0.5
American elm	44.8	37.5	7.0	0.2
Other elms	63.4	53.9	8.6	0.9
River birch	15.0	12.6	2.2	0.2
Hackberry	42.6	32.9	8.9	0.8
Other locusts	5.1	3.8	1.4	...
Sassafras	2.9	1.8	1.1	...
Dogwood	3.4	1.8	1.6	...
Holly	36.2	23.1	12.1	0.9
Other commercial	4.0	1.4	2.6	...
Total hardwoods	4021.2	3626.8	310.6	83.9
Noncommercial	63.8	...	63.8	...
All species	8867.4	8321.8	454.8	90.8

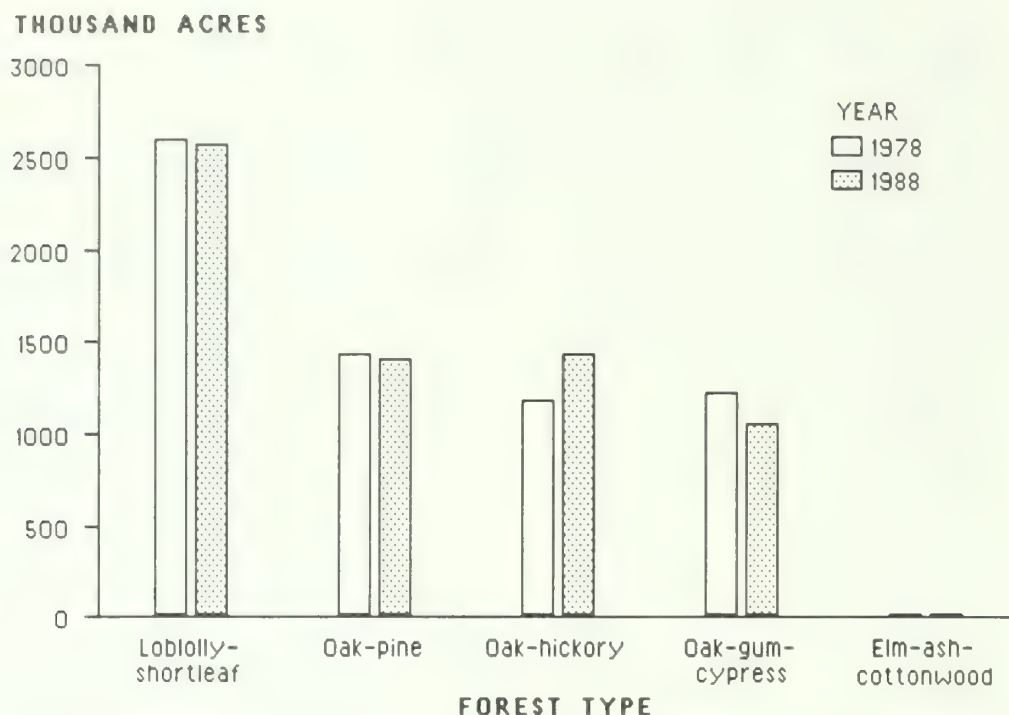


Figure 1.--Area of timberland by forest type, Southwest Arkansas, 1978 and 1988.

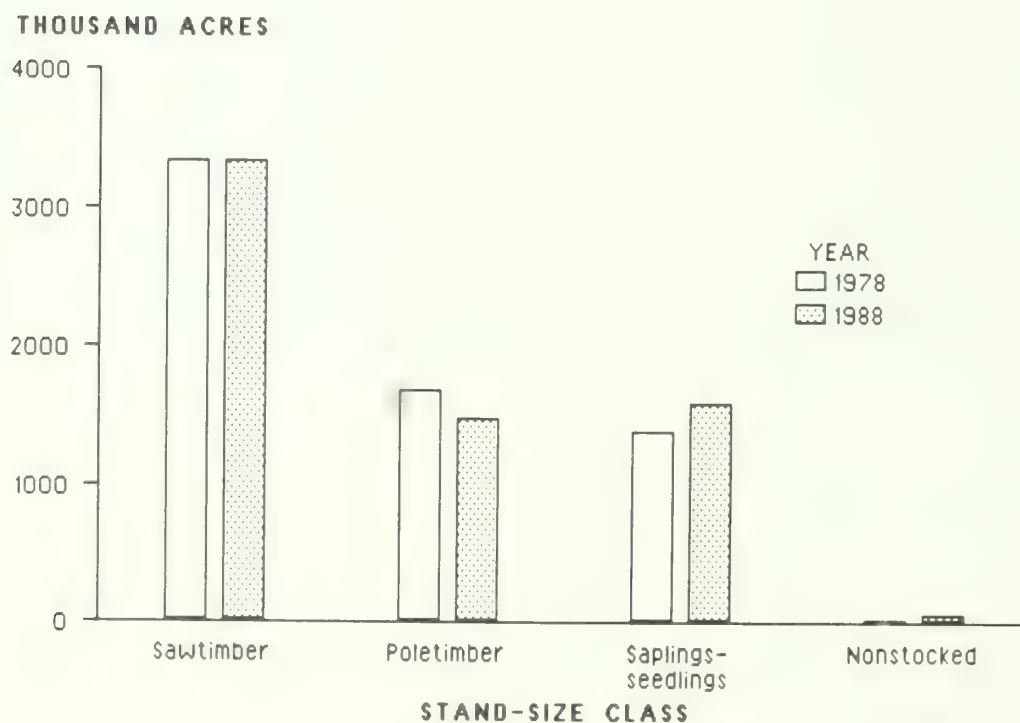


Figure 2.--Area of timberland by stand-size class, Southwest Arkansas, 1978 and 1988.

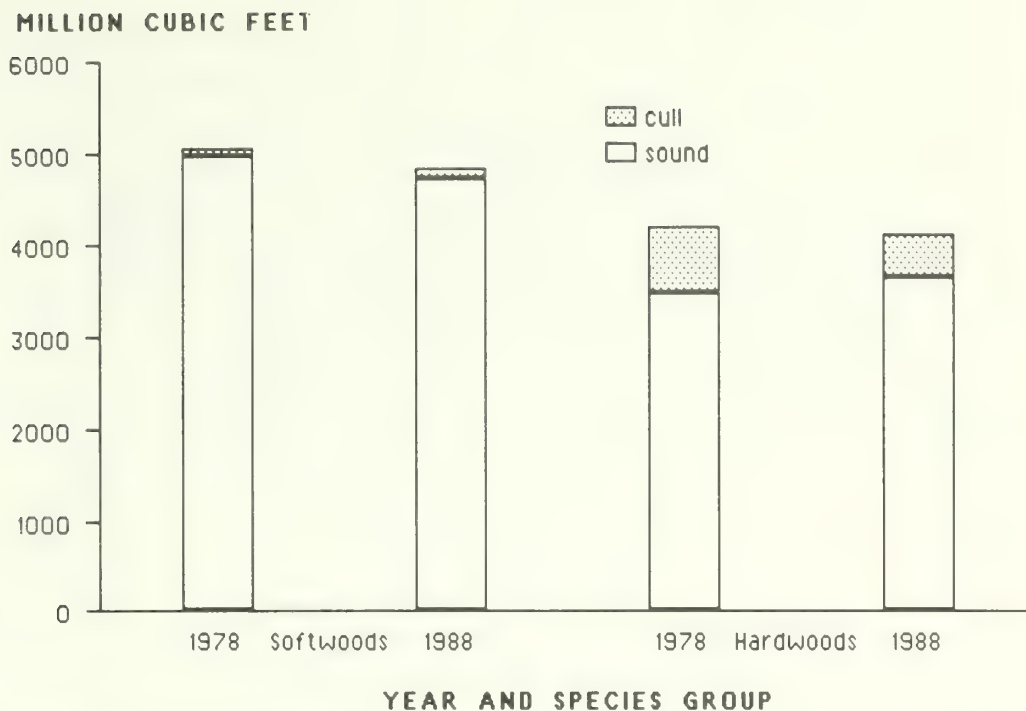


Figure 3.--Volume of timber on timberland by species group and class of timber, Southwest Arkansas, 1978 and 1988.

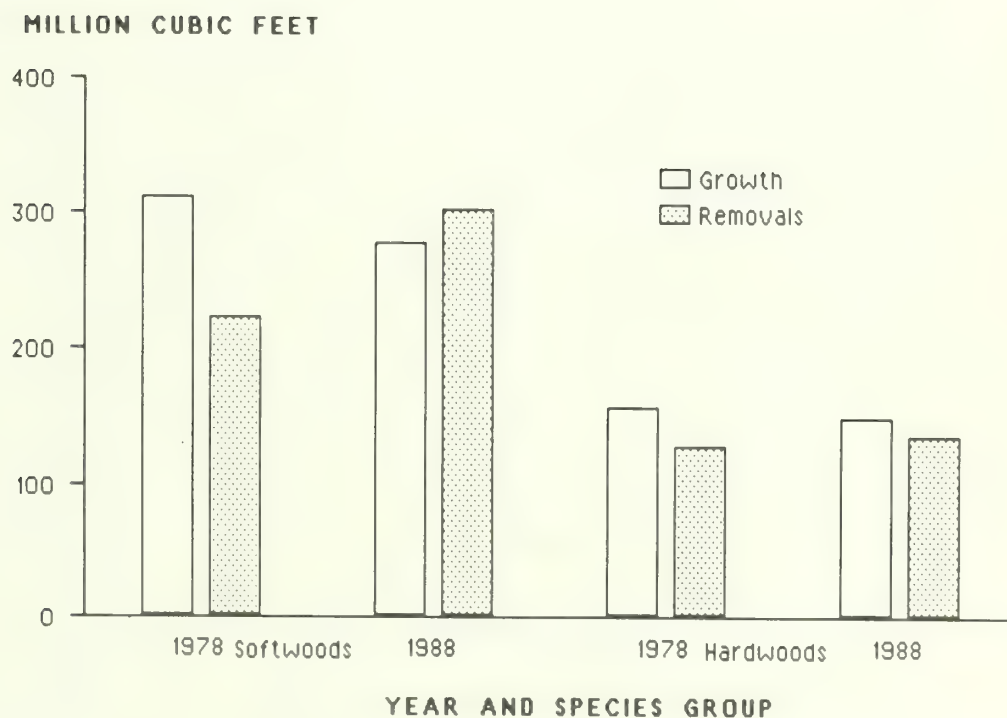


Figure 4.--Average net annual growth and average annual removals of growing stock on timberland by species group, Southwest Arkansas, 1978 and 1988.

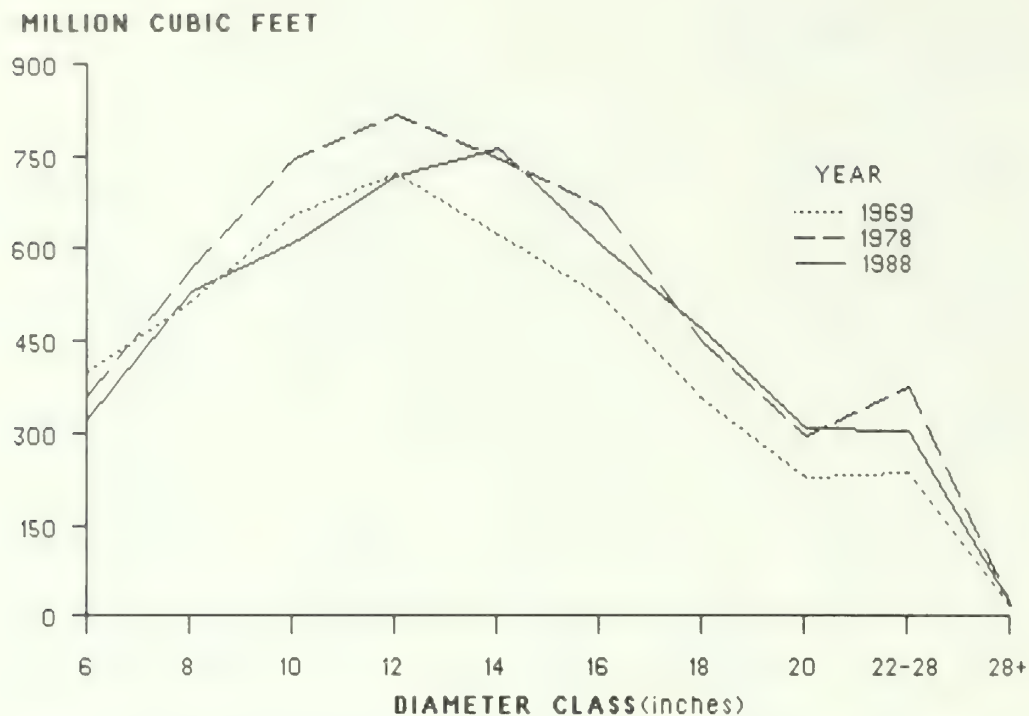


Figure 5.--Volume of softwood growing stock on timberland by diameter class, Southwest Arkansas, 1969, 1978, and 1988.

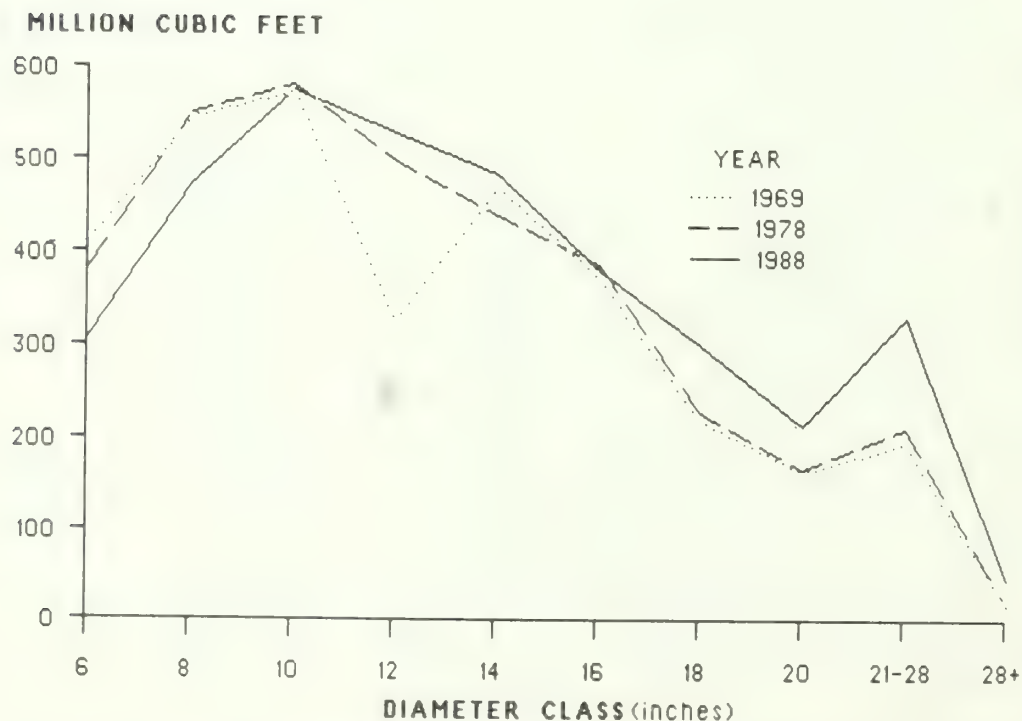


Figure 6.--Volume of hardwood growing stock on timberland by diameter class, Southwest Arkansas, 1969, 1978, and 1988.

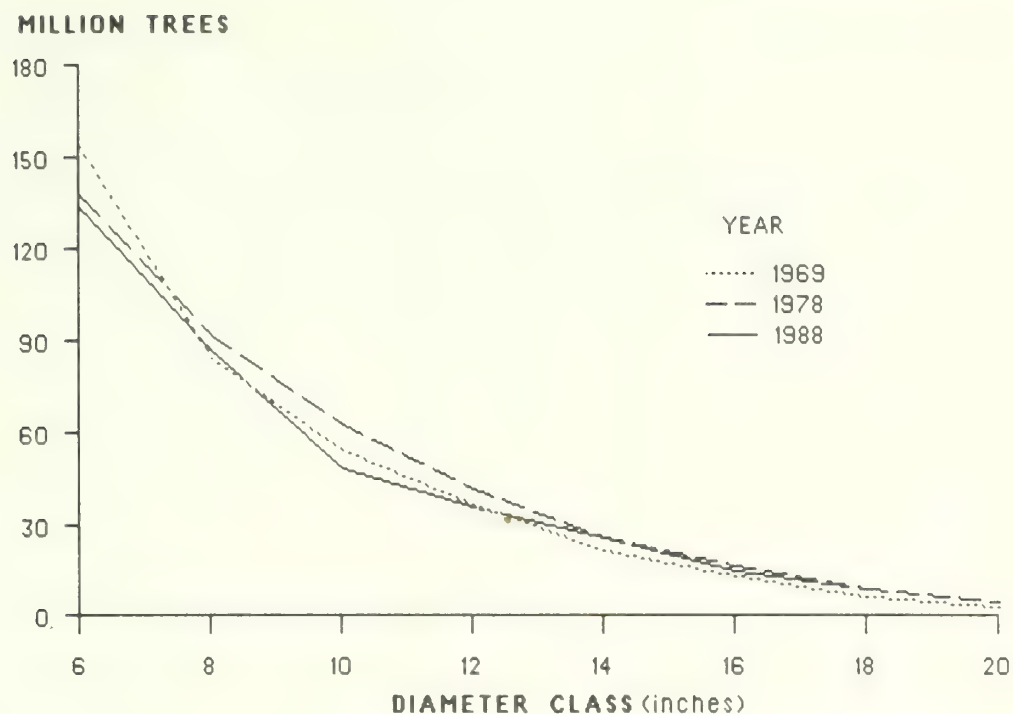


Figure 7.--Number of softwood growing-stock trees on timberland by diameter class, Southwest Arkansas, 1969, 1978, and 1988.

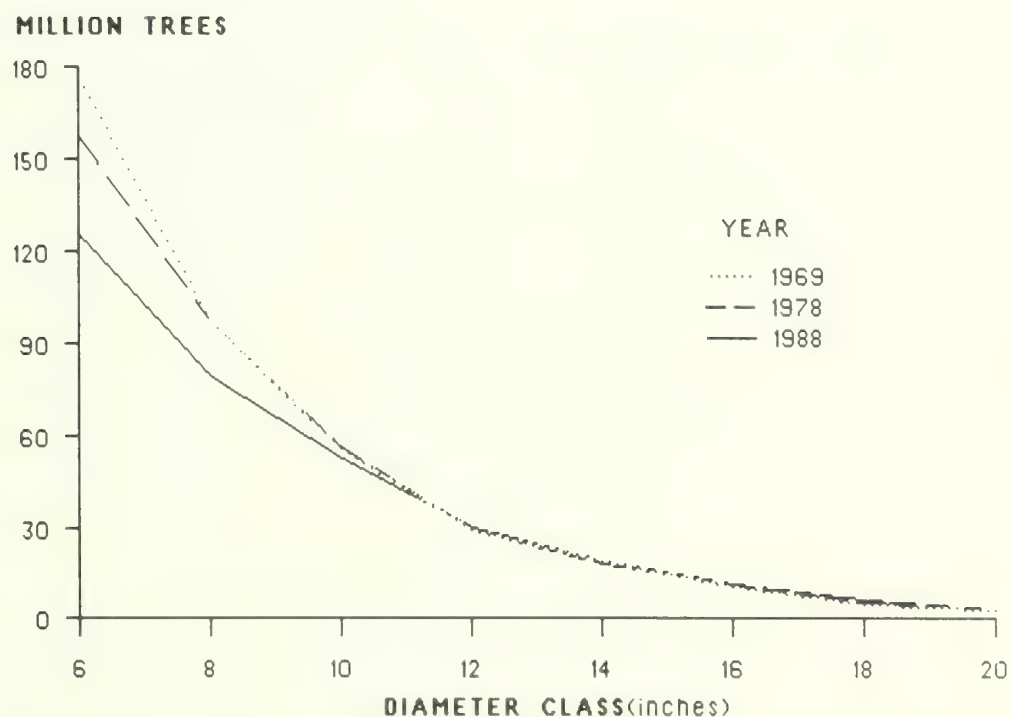


Figure 8.--Number of hardwood growing-stock trees on timberland by diameter class, Southwest Arkansas, 1969, 1978, and 1988.

PERCENT CHANGE

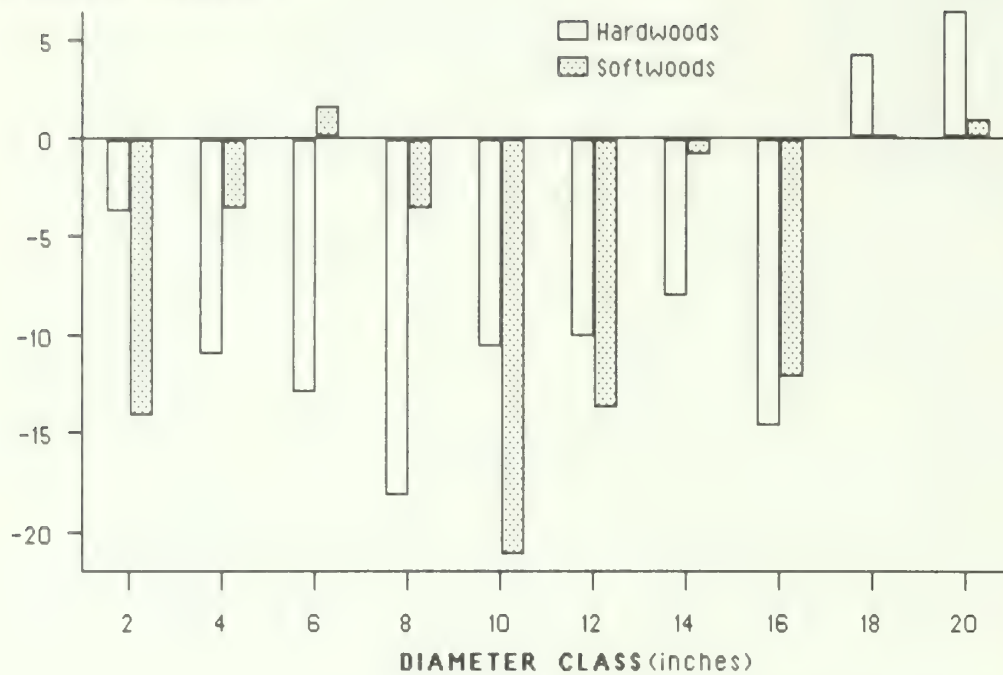


Figure 9.--Percent change in the number of live trees on timberland by species group and diameter class, Southwest Arkansas, 1978 and 1988.

Hines, F. Dee. Forest Statistics for Southwest Arkansas Counties—1988. Resource Bull. SO-140 . New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 1988. 32 p.

Tabulates forest resource information from a new inventory of Southwest Arkansas.

Additional Keywords: Area, volume, forest type, stand size, ownership.

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